

LEVEL II

HumRRO
Work Program

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HumRRO

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1969

Fiscal Year 1969
Work Program,

for

The Department of the Army

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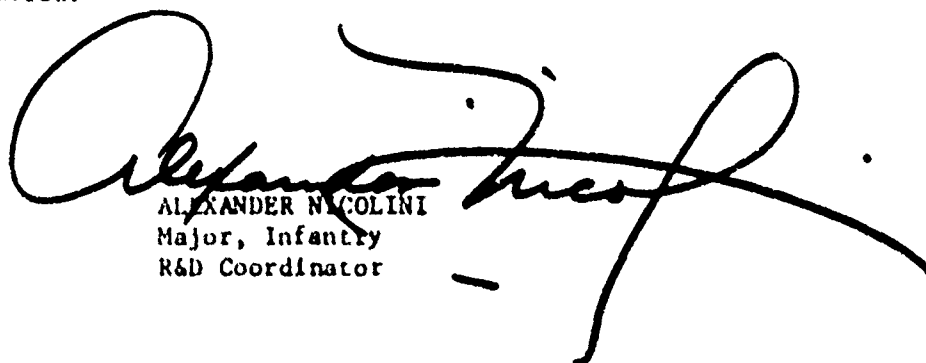
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FOR THE CHIEF:



ALEXANDER NICOLINI
Major, Infantry
R&D Coordinator

Corrected

Correction in Work Unit Numbers,
New Work Units, FY 1969 Work Program

<u>INCORRECT</u> <u>Work Unit Number</u> <u>Shown In</u> <u>FY 69 Work Program</u>	<u>Page In</u> <u>Work Program</u>	<u>Work Unit</u>	<u>Division</u>	<u>Correct</u> <u>Work Unit Number</u>
12-48	105 ✓	ATCSYSTEM	3	12-39
13-54	57 ✓	CANBCOM	4	13-23
13-55	95 ✓	INGROUP	4	13-24
11-45	97 ✓	JOBTEST	2	11-41
15-32	5 ✓	HANPROBE	6	15-12
15-33	109 ✓	PREDICT	6	15-13
16-24	81 ✓	REFRACT	7	16-14

20 February 1969



DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF RESEARCH AND DEVELOPMENT
WASHINGTON, D.C. 20310

10 January 1969

CRDBES

SUBJECT: Approval of Training Research and Development Work Program

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1. Under the provisions of AR 70-8, the FY 1969 Work Program for the Human Resources Research Office (HumRRO) of The George Washington University is approved and transmitted for your information and retention.
2. Subject to the availability of funds, HumRRO will conduct research within this program, and will continue to provide for (a) a Technical Advisory Service whereby HumRRO may make available assistance of an advisory nature in the solution of problems relating to the HumRRO mission, and (b) the careful exploration of areas likely to contain significant and researchable problems within the areas assigned them.
3. Ideas and suggestions for additional research to improve Army training may be submitted by an Army staff or command agency or individual under the procedures outlined in paragraph 5, AR 70-8. Informal, direct communication with the Director of HumRRO is authorized.

FOR THE CHIEF OF RESEARCH AND DEVELOPMENT:

GEORGE M. SNEAD, JR.
Colonel, GS
Director of Army Research

1 Incl
FY 69 Work Program

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Fiscal Year 1969

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for

The Department of the Army.

Research and Development in
Training, Motivation, and Leadership.

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HUMAN RESOURCES RESEARCH OFFICE

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FOREWORD

I. THE HumRRO PROGRAM OF RESEARCH for the Department of the Army

A. Purposes and Origins of the Research Program

The Department of the Army Work Program of the Human Resources Research Office (HumRRO) for FY 1969 is prepared in furtherance of Contract DA 44-189-ARO-2 between the Department of the Army and The George Washington University to conduct research in training methods, requirements for training devices, motivation, and leadership as jointly agreed by HumRRO and the Office of the Chief of Research and Development, Department of the Army.

The general goal of HumRRO research for the Department of the Army is to discover, develop, and apply human factors and social science principles and techniques to enhance the efficiency of both training and operational performance of military personnel. The objectives are to develop, for individuals and groups, (1) means for efficient acquisition of required military knowledges and skills, (2) procedures to insure retention of required knowledges and skills, and (3) ways to permit maximum utilization of acquired knowledges and skills in performing military duties.

HumRRO performs its research either on the premises of the contractor, The George Washington University, or at such military installations as may be appropriate in view of the nature of the research. At present, HumRRO consists of the Director's Office and supporting facilities, located at Alexandria, Virginia, and seven Research Divisions: Division No. 1 (System Operations), Alexandria, Virginia; Division No. 2 (Armor), Fort Knox, Kentucky; Division No. 3 (Recruit Training), Presidio of Monterey, California; Division No. 4 (Infantry), Fort Benning, Georgia; Division No. 5 (Air Defense), Fort Bliss, Texas; Division No. 6 (Aviation), Fort Rucker, Alabama; Division No. 7 (Language and Area Training), Alexandria, Virginia. Divisions No. 2 through 6 are colocated with U.S. Army Human Research Units.

The Chief of Research and Development (CRD), through the Behavioral Sciences Division of the Army Research Office, approves and supervises the HumRRO Army Work Program. The primary Army Regulations related to matters of funding and supervision of the research program are AR 70-6, AR 70-8, and AR 705-5. Proposals for HumRRO research to meet Army human factors needs may be made by any Army agency to CRD.

Command and agencies that sponsor HumRRO's program include the U.S. Continental Army Command, U.S. Combat Developments Command, Deputy Chief of Staff for Personnel, and Deputy Chief of Staff for Military Operations. A sponsor provides advice, guidance, and background data and information applicable to the research effort when requested to do so. The sponsor also designates a point of contact for purposes of coordination and information exchange.

The FY 1969 Work Program is predicated on funding guidance from the Behavioral Sciences Division, Army Research Office. Also included in the program is some additional research that can be done only if additional funding is available.

B. Present Status

Ninety-four percent of HumRRO's program for FY 1969 is exploratory development and advanced development, divided into three categories of effort. Exploratory Research Studies, Work Units, and Technical Advisory Service. The remaining 6% is allocated to Basic Research.

An Exploratory Research Study (ES) is an effort to evaluate the feasibility of engaging in a major research activity on a particular Army problem. In essence, such a study is a problem-defining activity in response to a military requirement. It entails a careful exploration of areas likely to contain significant problems on which research is possible, and of related work that may be under way. The product of the ES may be Technical Advisory Service or a Work Unit, or the exploration may indicate that the problem is not suitable or not profitable for further study under HumRRO's mission or facilities. Exploratory Studies account for 7% of the FY 1969 Work Program.

The major portion of the HumRRO program consists of the research efforts known as Work Units, which are usually initiated as a result of an Exploratory Study. Work Units are full-scale research projects designed to produce specific information or products aimed directly at an Army problem. They account for 81% of the total FY 1969 program.

In addition to the exploration of problem areas in Exploratory Studies and the conduct of research in Work Units, 6% of the HumRRO effort in FY 1969 is scheduled for Technical Advisory Service (TAS) performed on request. TAS activities are primarily of a consultative nature, and are undertaken either when sufficient information can readily be attained to provide a sound answer to a military problem or when, because of time pressures, the Army urgently needs a "best available" answer. The work of assisting Army personnel in implementing research findings and recommendations is carried on in some instances as part of programmed Work Units or Exploratory Studies and in some instances as TAS, depending on the stage of the research.

The Basic Research program (BR), which comprises 6% of the FY 1969 effort, deals with selected problems in the psychological and social sciences in which an increase in knowledge would (1) have special application to human factors problems in the military environment, and (2) contribute to the present body of facts and principles bearing upon training.

Certain of the research efforts are identified as Institutional Research. These studies do not require prior Department of the Army approval, but are included for informational purposes.

Two unfunded Exploratory Studies are included.

II. SUMMARY OF THE FY 1969 WORK PROGRAM

Activities in the HumRRO Work Program for FY 1969 have been grouped into six major Research Areas. These groupings, though not definitive or mutually exclusive, serve to indicate the nature of HumRRO work in relation to needs arising in major Army activities; they also serve to emphasize the interrelationships among HumRRO studies. Technical Advisory Service activities are described in a final section.

A tabular summary of the Work Program showing the location, category, and amount of effort in each Research Area is presented in Section IV, pages vi-vii. Work Units are indicated by code names, and Exploratory Studies and the Basic Research problems are identified by descriptive phrases and numbers. A total of 110 "basic man-years" has been allocated to the activities shown in the chart.¹ The man-years represented by the seven Directors of Research bring the total level of effort to 117 basic man-years.

The general scope of each Research Area and approximate amount of effort allocated to each are described in the following paragraphs.

Summary of Research Areas

Research Area I--Individual Training and Performance

Approximately 38% of HumRRO's total effort for FY 1969 is allocated to individual training and performance.

¹The Program assumes that existing military support for the Research Divisions will continue.

Research activities in this Research Area are directed toward the improvement of training of the individual soldier and toward determination of performance requirements for the individual soldier in various military systems. Research on training for the individual soldier includes studies relating to Basic Combat Training, Advanced Individual Training, and training for operation and maintenance of equipment (including weapons and aircraft). While development or improvement of a particular training program is the type of research frequently performed, the Research Area also includes a variety of related activities such as design and use of manuals and job aids, analysis of characteristics needed in training devices, study of abilities and skills required of the individual soldier in a particular military system, study of performance under field conditions, and capabilities of soldiers of limited aptitude.

Research Area 2--Unit Training and Performance

Approximately 7% of HumRRO's total effort for FY 1969 is allocated to unit training and performance.

The main emphasis of the research activities in unit training is upon training groups of men to work together effectively in order to attain a designated objective. While training of the group member in individual skills will be given attention as necessary, research efforts in this Research Area will concentrate on selected Army activities that require coordinated group behavior. In addition to work directly related to team-type training, the research will explore ways in which group organization and interpersonal relations contribute to group effectiveness.

Research Area 3--Training for Leadership, Command, and Control

Approximately 11% of HumRRO's total effort for FY 1969 is allocated to training for leadership, command, and control.

Research activities in this Research Area are directed toward increasing understanding of human factors aspects of leadership and command, and studying approaches to officer training. The field of interest includes infantry leadership at company and battalion levels, command and control in air defense systems and the problems of combined staffs.

Research Area 4--Language and Area Training

Approximately 10% of HumRRO's total effort for FY 1969 is allocated to language and area training.

The general objectives of efforts in this Research Area are to identify and improve training in skills that are important to success in stability operations in underdeveloped non-Western countries. Studies will be made to determine the skills, knowledges, and attitudes that are most likely to contribute significantly to success in stability operations. Training techniques to teach these cross-cultural attributes will be designed and tested. All research in this Research Area is conducted by Division No. 7 (Language and Area Training).

Research Area 5--Training Technology

Approximately 21% of HumRRO's total effort for FY 1969 is allocated to training technology.

Many HumRRO research activities make contributions, direct or indirect, to the development of a technology of training, but in this Research Area the Work Units and other research efforts are specifically concerned with the subject of technology. Their objective is to develop general methods for training individuals and groups and for maintaining desired performance, methods that would be applicable for a wide range of subject matter and training circumstances. The research deals with both instructor-administered and instructor-free training, and there is special interest in techniques--such as simulation, miniaturization, and automated, computer-administered instruction--that might lead to more efficient training, in terms of both time and money. There is also interest in ways of improving training effectiveness through improved motivation. The research includes not only the development of techniques suitable for immediate implementation, but also more basic explorations into the learning processes that might lead to marked improvements in future training efforts.

IV. Category and Amount of Effort by Research Area and Location

Research Area	HumRRO Division		
	No. 1 (System Operations)	No. 2 (Armor)	No. 3 (Recruit Training)
Area 1 Individual Training and Performance	(BMY) ES-58: Manual Format 1.5	Work Unit: (BMY) MBT 3.5 NIGHTSIGHTS 4.0	Work Unit: (BMY) *APSTRAT 3.5 *REALISTIC 4.5 SKILLCON 0.5 SPECTRUM 4.0 SUPPORT 0.5 *UTILITY 2.0
Area 2 Unit Training and Performance	(BMY) ES-63: Logistics Systems 2.0	Work Unit: (BMY) ENDURE 3.5	
Area 3 Training for Leadership, Command, and Control			
Area 4 Language and Area Training			
Area 5 Training Technology	Work Unit: (BMY) *IMPACT 17.0	Work Unit: (BMY) JOBTEST 1.0 BR-8: Common Job Elements 0.5 ISR-14: Prompting and Guidance 1.0 ISR-18: Behavior Management 1.0	
Area 6 Training Management	Work Unit: (BMY) STOCK 2.5		Work Unit: (BMY) ATCSYSTEM 3.0
Technical Advisory Service	TAS (BMY) 0.5	TAS (BMY) 1.0	
Percent of Total Effort	21%	14%	16%

BMY—Basic man-years ES—Exploratory Research Study BR—Basic Research Study TAS—Technical Advisory Service

HumPRO Division					Percent of Total Effort
No. 4 (Infantry)	No. 5 (Air Defense)		No. 6 (Aviation)	No. 7 (Language and Area Training)	
	Work Unit: (BMY) SKYFIRE 4.0 STAR 3.5		Work Unit: (BMY) MANPROBE 1.0 SYNTRAIN 3.0 UPGRADE 4.0		Area 1 38%
	BR-16: Visual Pattern Discrimination 2.0				
	(BMY)				Area 2 7%
	ES-54: Human Performance Degradation 2.0				
Work Unit: (BMY) ACTION 1.0 CAMBOC/ 2.0 IFORGE 2.5 LEAD 0.5 ES 60: Troop Information 2.0	Work Unit: (BMY) *MANICON 4.0				Area 3 11%
			Work Unit: (BMY) AREA 0.5 AUTOSPAN 2.5 *CONSERVE 0.0 COPE 2.5 *DEBRIEF 1.0 *REFOCUS 0.5 REFRACT 1.5 SOJOURN 2.0 *ES-73: U.S.-Thai Security Guard 0.5		Area 4 10%
Work Unit: (BMY) INCROUP 0.5 BR-19: Definition of Learning Variables 2.0					Area 5 21%
		Work Unit: (BMY) PREDICT 3.0			Area 6 8%
TAS (BMY) 2.0	TAS (BMY) 1.0	TAS (BMY) 1.0	TAS (BMY) 1.0		TAS 5%
12%	15%	11%	11%	Work Units 81% ES 7% BR 6% TAS 6%	

* indicates special funding † indicates institutional research

Research Area 6--Training Management

Approximately 8% of HumRRO's total effort for FY 1969 is allocated to training management.

Research in this area goes beyond improvements in training content and instructional methods. Studies in this area include analysis of the Army training organization and its place in the Army's structure as well as studies relating to administrative and organizational problems within the training organization. The Research Area includes studies directed toward necessary modification of training administrative procedures and organizational structure to allow effective introduction of improved instructional procedures.

Technical Advisory Service

Technical Advisory Service activities are expected to be similar to those in FY 1968; 5% of the work effort has been allocated to these activities. Anticipated TAS efforts are briefly summarized under Technical Advisory Service (page 117).

III. SUMMARY OF MAJOR CHANGES FROM FY 1968 WORK PROGRAM

A. Level of Effort

The FY 1969 HumRRO Work Program for the Department of the Army calls for 117 basic man-years. This includes an allocation of 113 basic man-years to specific research activities and 7 basic man-years for the Directors of Research Divisions.

B. Research Completed in FY 1968

Twelve Work Units that were in the FY 1968 Work Program do not appear in this year's program. Research in seven Work Units (CNIC, CONTROL, HAWKEYE, JACK, STRANGER, TRAINMAN, WACLEAD) was completed. Five Work Units were terminated (ECHO, MAP, SIMULATE, TESTAID, UNIFECT). Two of these were reoriented as new Work Units (ECHO to SYNTRAIN, MAP to REFRACT).

Six Exploratory Studies that were in the FY 1968 Work Program do not appear in this year's program. Five resulted in Work Units (ES-50 and ES-70 to PREDICT, ES-61 to MANPROBE, ES-64 to CAMPCOM, and ES-69 to ATCSYSTEM). ES-72 was completed.

C. Research Scheduled for Completion in FY 1969

The Work Units scheduled for completion during FY 1969 are ACTION, CCMSEVE, LEAD, SUPPORT, and UTILITY.

D. Research to be Initiated in FY 1969

Seven new Work Units (ATCSYSTEM, CAMPCOM, INGROUP, JOBTST, MANPROBE, PREDICT, REFRACT) and three new Exploratory Studies (ES-58, ES-63, ES-73) are in the FY 1969 Work Program.

Three new Work Units were initiated during FY 1968 (APSTRAT, REALISTIC, SYNTRAIN).

E. Unfunded Efforts

Two new Exploratory Studies are included which would require additional funding.

FORMAT OF THE WORK PROGRAM

Each of the first six sections of the FY 1969 Work Program describes one Research Area. An introduction (on bull pages) names the Work Units, Exploratory Research Studies, and Basic Research Studies, describes the Research Area in general terms, and states the level of effort proposed for FY 1969. Technical Advisory Service statements are collected in the seventh section of the Work Program.

Indexes (on bull pages) at the end of the report list Work Units, Exploratory Research Studies, Basic Research Studies, and the location of these activities according to the Research Division conducting the research.

Further information in regard to HumRRO research efforts may be obtained from the Directors of the HumRRO Research Divisions.

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CONTENTS

	Page
FOREWORD	iii
RECORD OF CHANGES	xv
EXPLANATORY NOTES	xvii
 Research Area 1: INDIVIDUAL TRAINING AND PERFORMANCE	 1
Work Units	
APSTRAT Training Strategies Appropriate to Aptitude Level for Selected Training Courses	3
MANPROBE Human Information-Processing Requirements in Manned Aerial Reconnaissance and Surveillance Tasks	5
MBT Training Guidelines for the US/FRG Main Battle Tank	7
NIGHTSIGHTS Training Techniques for New Night Vision Devices	9
REALISTIC Determination of Reading, Listening, and Arithmetic Skills Required for Major Military Occupational Specialties.	13
SKILLCON Curriculum Engineering to Enhance the Soldier's Resistance to Stress in Combat and Hazardous Job Situations	17
SKYFIRE Training Methods for Forward Area Air Defense Weapons	19
SPECTRUM Development of Efficient Training Across All Aptitude Levels ...	23
STAR Aircraft Recognition Training	27
SUPPORT Development of Improved Training for Combat Support Training ...	29
SYNTRAIN Modernization of Synthetic Training in Army Aviation	31
UPGRADE Improving Aviation Maintenance Training Through Task and Instructional Analysis	35
UTILITY Study of Men in Lower Mental Categories: Job Performance and the Identification of Potentially Successful and Potentially Unsuccessful Men	39
 Exploratory Research Study	
Manual Format (ES-58)	41
 Basic Research Study	
Visual Pattern Discrimination (BR-16)	43
 Unfunded	
Personnel Management Technicians (ES-)	45
 Research Area 2: UNIT TRAINING AND PERFORMANCE	 47
Work Unit	
ENDURE Tank Crew Performance During Periods of Extended Combat	49

	Page
Exploratory Research Studies	
Human Performance Degradation (LS-54)	51
Logistics Systems (ES-63)	52
 Research Area 3: TRAINING FOR LEADERSHIP, COMMAND, AND CONTROL	 53
Work Units	
ACTION Research for Improvement of Infantry Stability Operations Training	55
CAMBCOM Knowledges, Skills, and Thought Processes of the Battalion Commander and Primary Staff	57
FORGE Factors in Organizational Effectiveness	59
LEAD Development of Training for Improving the Combat Skills of Leaders in Small Infantry Units	61
MANICON Determination of Performance Capabilities and Training Require- ments for Manual Command and Control Functions of the Sentinel Weapon System	63
Exploratory Research Study Troop Information (ES-60)	65
 Research Area 4: LANGUAGE AND AREA TRAINING	 67
Work Units	
AREA Development of Concepts and Techniques for Area Training	69
AUTOSPAN Development of a Generalized Method for Preparing Self- Instructional Foreign Language Courses	71
COMSERVE Development of a Manual for Community Service Volunteers	73
COPE A Program of Instruction for the Development of Cultural Self-Awareness	75
DEBRIEF Feasibility Study of a System for Debriefing MAAG Advisors.	77
REFOCUS Implementation and Modification of the USMACTHAI Advisor Debriefing Program	79
REFRACT Factors Influencing Effectiveness of Advisor- Counterpart Interactions	81
SOJOURN Overseas Military Posts and Communities	85
Exploratory Research Study U.S.-Thai Security Guard (ES-73)	87
 Research Area 5: TRAINING TECHNOLOGY	 89
Work Units	
IMPACT Instructional Model/Prototypes Attainable in Computerized Training	91
INGROUP Small-Group Instructional Methods	95
JOBTEST Proficiency Measurement Techniques	97

	Page
Basic Research Studies	
Common Job Elements (BR-8)	99
Prompting and Guidance (BR-14)	100
Behavior Management (BR-18)	101
Definition of Learning Variables (BR-19)	102
 Research Area 6: TRAINING MANAGEMENT	 103
Work Units	
ATCSYSTEM Analysis of the Army Training Center System	105
PREDICT Correlational Analysis of Aviator Performance	109
STOCK Development of Training Management Procedures for Heterogeneous Ability Groups	111
Unfunded	
Civilian Work Force (ES-)	115
 TECHNICAL ADVISORY SERVICE	 117
 INDEXES	
Work Units	119
Exploratory Research Studies, by Title	120
Exploratory Research Studies, by Number	120
Basic Research Studies, by Title	121
Basic Research Studies, by Number	121
Research Division Programs	121

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EXPLANATORY NOTES

1. Each Research Area is introduced by a summary statement including listings of the various research efforts, the scope of the research in the area, and the amount of effort to be expended in professional, or basic, man-years (BMY).

2. Each Work Unit Statement includes in paragraph 3 the title of the military agency sponsoring that Work Unit. The sponsor provides advice, guidance, and background data and information applicable to the research effort when requested to do so. The sponsor also designates a point of contact for purposes of coordination and information exchange.

3. Each Work Unit Statement includes a Work Sub-Unit summary chart in which the progress of the Work Unit is forecast. Symbols used to indicate the status of work in given fiscal year quarters are:

- P - Planning and research design
- C - Collection of data or conduct of experiment
- A - Analysis of data
- D - Draft report preparation and preparation of final report
- S - Submission of report to OCRD

An asterisk (*) in the first block of the chart indicates that phases have occurred prior to the beginning of Fiscal Year 1969.

4. Each Exploratory Research Study statement, in addition to summarizing the military problem area for which feasibility of research will be assessed, indicates the military agencies most directly concerned and the BMY level assigned to the study. Each Basic Research Study statement gives the psychological or social science problem under study and indicates the BMY level of effort. Technical Advisory Service summaries list advisory activities that are scheduled or anticipated, and indicate military agencies to whom assistance may be provided, and the estimated level of effort.

Research Area 1:
INDIVIDUAL TRAINING AND PERFORMANCE

Research Area 1:

Individual Training and Performance

Title:

Work Units

Training Strategies Appropriate to Aptitude Level for Selected Training Courses (APSTRAT)
Human Information-Processing Requirements in Manned Aerial Reconnaissance and Surveillance Tasks (MANPROBE)
Training Guidelines for the US/FRG Main Battle Tank (MBT)
Training Techniques for New Night Vision Devices (NIGHTSIGHTS)
Determination of Reading, Listening, and Arithmetic Skills Required for Major Military Occupational Specialties (REALISTIC)
Curriculum Engineering to Enhance the Soldier's Resistance to Stress in Combat and Hazardous Job Situations (SKILLCON)
Training Methods for Forward Area Air Defense Weapons (SKYFIRE)
Development of Efficient Training Across All Aptitude Levels (SPECTRUM)
Aircraft Recognition Training (STAR)
Development of Improved Training for Combat Support Training (SUPPORT)
Modernization of Synthetic Training in Army Aviation (SYNTRAIN)
Improving Aviation Maintenance Training Through Task and Instructional Analysis (UPGRADE)
Study of Men in Lower Mental Categories: Job Performance and the Identification of Potentially Successful and Potentially Unsuccessful Men (UTILITY)

Exploratory Research Study

Manual Format (ES-58)

Basic Research Study

Visual Pattern Discrimination (BR-16)

Unfunded

Personnel Management Technicians (ES-)

Description:

Research activities in this area are directed toward the improvement of training and performance of the individual soldier, and toward determination of performance requirements for the individual soldier in various military systems. Research on training for the individual soldier includes studies relating to Basic Combat Training, Advanced Individual Training, and training for the operation and maintenance of equipment (including weapons and aircraft). While development or

improvement of a particular training program is the type of research frequently performed, the Research Area also includes a variety of related activities such as design and use of manuals and job aids, analysis of characteristics needed in training devices, study of abilities and skills required of the individual soldier in a particular military system, study of performance under field conditions, and relative performance of soldiers at different aptitude levels.

Level of Effort in FY 1969: 41.5 BMVs.

WORK UNIT STATEMENT

1. Training Strategies Appropriate to Aptitude Level for Selected Training Courses—APSTRAT (Continuing)
2. Location: HumRRO Division No. 3 (Recruit Training)
3. Sponsors: Assistant Secretary of Defense (Manpower)
Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research. To develop and test training strategies appropriate for various levels of aptitude in the operational field-training context of a variety of military occupational specialties (MOSs).
 - b. Potential Military Research End-Result. The practical products of this research will be field-tested training strategies appropriate for various aptitude levels. These will have been demonstrated across a variety of high-density military training courses and will reflect the constraints Army training personnel encounter in day-to-day operations. Cost/effectiveness will be analyzed, estimating relative gains in proficiency against requirements in training time, cadre, facilities, and equipment. This effort will provide information as to (1) which training strategies are appropriate for which aptitude levels, and (2) realistic expectations on the costs and administrative problems that would be involved in their adoption.
 - c. Background and Summary. At the request of the Chief of Research and Development, Department of the Army, HumRRO proposed this Work Unit for sponsorship by the Office of the Assistant Secretary of Defense (Manpower) under the Long-Range Research Area of Project 100,000, which is concerned with the induction of men of lower aptitude into the Army. The Work Unit was approved and funded in the last quarter of FY 1968.

With Project 100,000 under way, a wide variety of training is being designed, re-engineered, or in some fashion modified to accommodate a wider range of student aptitude. Unfortunately, present training technology does not specify how to go about this; it is not known which training strategies are best suited to particular aptitude levels.

The work of this Work Unit will be done primarily at Fort Ord, California, utilizing the various combat, service, clerical, and semitechnical training courses in operation there. As the need arises, research personnel will travel to other continental U.S. (CONUS) training installations.

Entire high-density course sequences are being selected for use in field testing experimental or prototype training strategies. For the experimental work, training courses are being selected that are (1) representative of the high-density combat and combat support MOSs, (2) representative across Services, (3) relevant to civilian occupations, and/or (4) representative of both individual and team performance.

APSTRAT

- d. FY 69 Projection. Training strategies to accommodate individual differences in aptitude will be derived from the developing training technology, the findings of related research being conducted in support of Project 100,000, and the findings of HumRRO's Work Unit SPECTRUM. SPECTRUM findings on the interaction of training method with aptitude and task complexity will find direct application in APSTRAT.

Examples of possible strategies to be tested are (1) achieving a defined level of proficiency at varying time rates, (2) achieving varying levels of proficiency within a fixed time, (3) instructing homogeneous groups by different methods, (4) designing instruction to permit extensive independent study, (5) providing remedial adjuncts to main curricula, or recycling loops for early failures. The judicious use of appropriate media of presentation (e.g., TV, programed texts), the functional context approach, simulation, and training devices and aids will be common to the development of all strategies.

5. Estimated Professional Man-Years Required:

FY 69: 3.5

FY 70: 3.0

6. Interested Agencies:

Deputy Chief of Staff for Individual Training, U.S. Continental
Army Command
U.S. Army Training Centers
Department of Health, Education, and Welfare
Department of Labor
Office of Economic Opportunity

7. Work Sub-Unit Summary and Forecast:

- I. Training strategies appropriate to aptitude level for selected training courses:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*CA	PC	PCA	CA	CAD	CAD	CAD	CAD

WORK UNIT STATEMENT

1. Human Information-Processing Requirements in Manned Aerial Reconnaissance and Surveillance Tasks—MANPROBE (New)
2. Location: HumRRO Division No. 6 (Aviation)
3. Sponsors: U.S. Army Combat Developments Command Aviation Agency
U.S. Continental Army Command
4. Scope:
 - a. Objective of Research. To identify and assess perceptual-cognitive functions associated with manned aerial reconnaissance and surveillance (R&S) tasks important to the success of operational R&S missions.
 - b. Potential Military Research End-Result. The results should provide Army system planners with better means of predicting the man-machine interactions in future manned aerial R&S systems, as well as providing guidance for training. Army planners trying to estimate the effect of new airborne R&S equipments on operational effectiveness do not have data on man's functional relationship with other system components, and hence do not have a base for estimating man's capability in proposed future systems. In the research, man's primary roles in aerial R&S systems will be examined within the framework of an information processing model, to obtain data that may be extrapolated from present to future requirements.
 - c. Background. HumRRO was requested by the Tactical Aerial Reconnaissance and Surveillance 75 (TARS-75) Study Group of the U.S. Combat Developments Command Aviation Agency to examine human factors aspects of future aerial R&S systems. A literature survey indicated that data on the operational capabilities of personnel in aerial R&S systems are not generally available, so, in lieu of hard data, crew member behavior during simulated operational missions was analyzed for the systems under study. Expert military opinion was obtained on the activities performed by each aircrew member during the more important segments of the flight mission, taking into consideration the various information sources upon which the individual had to depend in order to accomplish the mission's objective. The results of the analysis permitted a crude comparison among operational capabilities of crew members in a wide variety of R&S aerial systems.

In a follow-up study on the problems of evaluating aerial R&S system performance and improving crew performance (ES-61), the simple information processing model used in the TARS-75 Study was expanded in an effort to create a broad outline appropriate for analyzing crew member activities in manned aerial R&S systems.

The intent in MANPROBE is to relate the expanded information processing model to operational R&S tasks and experiences of combat personnel, in order to specify the perceptual-cognitive functions critical to those tasks.

Then, the information handling capabilities of aerial personnel for selected R&S tasks are to be assessed to provide a data base for future system planning.

- d. Method of Attack. As the first step toward identifying and assessing R&S tasks, using the information processing model, Vietnam returnees who have participated in operational missions and who have held staff positions will be asked to identify the concepts of operation, develop mission diagrams and profiles, identify R&S equipment, and determine the mode of equipment utilization. From this information a structured R&S interview will be developed. Using operational personnel, it will then be pretested and administered. Interview results will be analyzed and evaluated to determine the human information processing requirements for events which are significant to mission success.

In MANPROBE II, the information processing capabilities of aircrew members in selected R&S tasks will be assessed. Tasks will be derived from the significant events identified in the interview. To the extent feasible, these events will be simulated in laboratory studies designed to provide substantive data.

5. Estimated Professional Man-Years Required:

FY 69: 1.0

FY 70: 1.5

6. Interested Agencies:

U.S. Army Combat Developments Command
U.S. Army Security Agency
U.S. Army Behavioral Science Research Laboratory
U.S. Army Combat Surveillance School/Training Center

7. Work Sub-Unit Summary and Forecast:

- I. Identification of crew member information processing requirements in aerial R&S missions:

FY 69				FY 70			
1	2	3	4	1	2	3	4
P	PC	CA	CAD	D	S		

- II. Assessment of crew member performance during information processing for selected R&S tasks:

FY 69				FY 70			
1	2	3	4	1	2	3	4
				P	PC	CA	CAD

WORK UNIT STATEMENT

1. Training Guidelines for the US/FRG Main Battle Tank—MBT (Continuing)
2. Location: HumRRO Division No. 2 (Armor)
3. Sponsor: U.S. Army Materiel Command (Program Manager, US/FRG MBT)
4. Scope:

- a. Objective of Research. To outline the training methods and prescribe training materials that will be required by the personnel responsible for the development of programs for operator training and user maintenance training on the US/FRG Main Battle Tank.
- b. Potential Military Research End-Result. This Work Unit will:
 - (1) Provide a human performance data base for evaluating weapon system performance requirements and specifying required MOS structures.
 - (2) Provide training objectives and standards for School, Center, and Unit training program planning.
 - (3) Identify the unique training requirements and additional training methods necessary for Schools, Centers, and Units to accomplish training.
 - (4) Provide materials and methodology for evaluating the effectiveness of new training programs (methods and devices).
- c. Background and Summary. The developmental program for the US/FRG Main Battle Tank is being directed towards markedly new equipment concepts. The training demands imposed cannot be estimated from experience with existing equipment, since similar concepts have not been previously employed. Research into the job and training requirements for the MBT was therefore undertaken in order to determine the skill requirements, provide the training methods, and identify the materials necessary for timely training program development. Preliminary job task descriptions for crew operation and maintenance were completed and submitted to the Program Manager for review and revision.

During FY 1968 the revised crew descriptions, received from the Program Manager, were integrated into functional procedures. System standards were specified for "critical" tasks and human performance standards and training objectives were derived for those tasks. The supplementary crew analyses of the M60A1E1/E2 tank and the M-551 vehicle were completed and utilized as a comparison basis for determining unique training objectives for the MBT. Studies of training techniques and materials were initiated.

The job descriptions for organizational maintenance of the MBT were completed and unique tasks were identified. These tasks were organized according to job functions and training objectives were written.

- d. FY 69 Projection. Unique training objectives for crew operation and user maintenance will be reported. The development of training

techniques and materials for the MBT will be continued and reported as completed. Assistance will be provided in the administrative processes for incorporating new training methods into present training programs. Standardized proficiency tests for both crew and mechanic will be developed in coordination with other human factors agencies and with the U.S. Continental Army Command.

5. Estimated Professional Man-Years Required:

FY 69: 5.5

FY 70: 3.5

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel,
Department of the Army
Office of the Assistant Chief of Staff for Force Development,
Department of the Army
U.S. Army, Europe
U.S. Army Combat Developments Command
U.S. Continental Army Command
U.S. Army Human Engineering Laboratories
U.S. Naval Training Device Center

7. Work Sub-Unit Summary and Forecast:

I. Job analysis for operation and organizational maintenance:

a. Operation: Completed.

b. Organizational maintenance: Completed.

II. Identification of training objectives, techniques, and materials:

a. Crew training:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*PD	PCD	CAD	DS	S			

b. Organizational maintenance training:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*D	PD	PD	CAP	AD	S		

III. Assistance in training, program planning, and evaluation when required:

a. Crew training effectiveness:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*P	P	C	C				

b. Organizational maintenance training effectiveness:

FY 69				FY 70			
1	2	3	4	1	2	3	4
		P	P	P	C	C	C

WORK UNIT STATEMENT

1. Training Techniques for New Night Vision Devices—NIGHTSIGHTS
(Continuing)

2. Location: HumRRO Division No. 2 (Armor)

3. Sponsor: U.S. Army Combat Developments Command

4. Scope:

- a. Objectives of Research. To identify critical human factors problems in the use of new night operations devices, and to develop effective techniques of training in the use of the devices.
- b. Potential Military Research End-Result. While the advent of night vision devices has given the Army additional operational scope, it has raised many problems. The research should:
 - (1) Yield a firmer knowledge of target acquisition and engagement methods under darkness with night operations devices.
 - (2) Produce realistic training programs for night operations devices.
 - (3) Develop increased mobility at night through the use of night operations devices.
 - (4) Engender specific techniques for employing night vision devices in conjunction with artificial illuminants.
 - (5) Provide more specific data on the relationship between use of night operations devices and loss of dark adaptation.
- c. Background and Summary. Attention has been directed toward (1) broadly assessing the impact of image intensifiers from a human factors standpoint, and (2) specifically measuring some behavioral effects associated with the loss of dark adaptation. In NIGHTSIGHTS I information on the dark adaptation recovery time needed for effective cross-country movement after use of an intensifier was provided, as was information on the ability to return fire on a silhouette target after using an intensifier.

In NIGHTSIGHTS II the effects of factors that influence the course of dark adaptation are being studied in a further attempt to identify factors that will facilitate or impair performance under conditions of dark adaptation in the operational situation. An adaptometer has been constructed to permit presentation of patterned stimuli of controlled brightnesses during preadaptation and during the test of sensitivity in the dark.

Two general areas requiring further study were identified in NIGHTSIGHTS III: the viewing problems arising from the optical characteristics of image intensifiers, and the problems found during tactical employment of the devices.

NIGHTSIGHTS IV, which is a combination of NIGHTSIGHTS IV and V from the FY 1968 Work Program, will seek to develop training programs for each type of target detection device to be evaluated in the SEA NITEOPS program.

NIGHTSIGHTS

- d. FY 69 Projection. NIGHTSIGHTS II will be completed. Viewing problems found in NIGHTSIGHTS III will be reviewed by the Armor Panel and U.S. Army Combat Developments Command, and those given high priority will be attacked. For NIGHTSIGHTS IV, training programs for specific night operations devices will be developed and tested as required to meet SEA NITEOPS schedules.

5. Estimated Professional Man-Years Required:

FY 69: 4.0

FY 70: 4.0

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel, Department of the Army
Office of the Assistant Chief of Staff for Force Development, Department of the Army
U.S. Continental Army Command
U.S. Army Combat Developments Command Experimentation Command
U.S. Army Armor School
U.S. Army Behavioral Science Research Laboratory
U.S. Army Mobility Equipment Research and Development Center
U.S. Army Human Engineering Laboratories
U.S. Army Medical Research Laboratory
Frankfort Arsenal

7. Work Sub-Unit Summary and Forecast:

- I. Effects of loss of dark adaptation on performance in representative field situations: Completed.
- II. Determination of the relationship between conditions of dark adaptation and (1) duration, configuration, and intensity of simulation, (2) performance requirements, and (3) modification of perception through training:

FY 69			
1	2	3	4
CA	AD	D	DS

- III. Survey of problems in the tactical employment of night viewing devices:

FY 69			
1	2	3	4
S			

- IV. Training program development for specific device categories in SEA NITEOPS:

A. Image Intensifiers

Schedule Classified

- B. Area Illumination
Schedule Classified
- C. Infra-Red
Schedule Classified
- D. Radar
Schedule Classified

WORK UNIT STATEMENT

1. Determination of Reading, Listening, and Arithmetic Skills Required for Major Military Occupational Specialties—REALISTIC (Continuing)
2. Location: HumRRO Division No. 3 (Recruit Training)
3. Sponsors: Assistant Secretary of Defense (Manpower)
Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objectives of Research. To determine the levels of reading, listening, and arithmetic skills required for the satisfactory performance of essential job duties in major military occupational specialties (MOSs), and to develop guidelines and methodologies for reducing discrepancies between personnel skill levels in reading, listening, and arithmetic, and levels of these skills required by the job.
 - b. Potential Military Research End-Result. Information from this research effort should help reduce school attrition rates and improve job performance by (1) providing guidelines and methodologies for more precisely matching personnel skill levels with training and job requirements in these skills, and (2) developing techniques for improving literacy skills through training. In addition, manpower pools for a given MOS should be enlarged due to the development of methodologies for reducing the difficulty levels of reading, listening, and arithmetic materials used in training and on the job.
 - c. Background and Summary. At the request of the Chief of Research and Development, Department of the Army, HumRRO proposed this Work Unit for sponsorship by the Office of the Assistant Secretary of Defense (Manpower) under the Long-Range Research Area of Project 100,000, which is concerned with the induction into the Army of men of lower aptitude. The Work Unit was subsequently approved and funded as of the last quarter of FY 1968. Of concern to the Army is the fact that many of these lower-aptitude men are deficient in basic literacy and arithmetic skills. The impact of their deficiency for the Army depends upon the importance of these skills for the job to which the men are assigned. Obviously, if a job does not require very highly developed literary and arithmetic skills, a deficiency in them is not apt to hinder performance.

The problem for REALISTIC is to determine what levels of reading, listening, and arithmetic skills are essential for successful job performance. This involves using or developing tools for assessing the difficulty level of reading, listening, and arithmetic materials the inductee may encounter in major MOSs. It also involves developing screening tests to accurately match the skill levels of Army inductees with the skill levels required by the job.

Unique to Work Unit REALISTIC is the investigation of requirements for listening skills. Lack of ability to read well may be considered an

- B. Area Illumination
Schedule Classified
- C. Infra-Red
Schedule Classified
- D. Radar
Schedule Classified

WORK UNIT STATEMENT

1. Determination of Reading, Listening, and Arithmetic Skills Required for Major Military Occupational Specialties—REALISTIC (Continuing)
2. Location: HumRRO Division No. 3 (Recruit Training)
3. Sponsors: Assistant Secretary of Defense (Manpower)
Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objectives of Research. To determine the levels of reading, listening, and arithmetic skills required for the satisfactory performance of essential job duties in major military occupational specialties (MOSSs), and to develop guidelines and methodologies for reducing discrepancies between personnel skill levels in reading, listening, and arithmetic, and levels of these skills required by the job.
 - b. Potential Military Research End-Result. Information from this research effort should help reduce school attrition rates and improve job performance by (1) providing guidelines and methodologies for more precisely matching personnel skill levels with training and job requirements in these skills, and (2) developing techniques for improving literacy skills through training. In addition, manpower pools for a given MOS should be enlarged due to the development of methodologies for reducing the difficulty levels of reading, listening, and arithmetic materials used in training and on the job.
 - c. Background and Summary. At the request of the Chief of Research and Development, Department of the Army, HumRRO proposed this Work Unit for sponsorship by the Office of the Assistant Secretary of Defense (Manpower) under the Long-Range Research Area of Project 100,000, which is concerned with the induction into the Army of men of lower aptitude. The Work Unit was subsequently approved and funded as of the last quarter of FY 1968. Of concern to the Army is the fact that many of these lower-aptitude men are deficient in basic literacy and arithmetic skills. The impact of their deficiency for the Army depends upon the importance of these skills for the job to which the men are assigned. Obviously, if a job does not require very highly developed literary and arithmetic skills, a deficiency in them is not apt to hinder performance. The problem for REALISTIC is to determine what levels of reading, listening, and arithmetic skills are essential for successful job performance. This involves using or developing tools for assessing the difficulty level of reading, listening, and arithmetic materials the inductee may encounter in major MOSSs. It also involves developing screening tests to accurately match the skill levels of Army inductees with the skill levels required by the job. Unique to Work Unit REALISTIC is the investigation of requirements for listening skills. Lack of ability to read well may be considered an

REALISTIC

obstacle which reduces the motivation of Category IV men to study. Possibly replacing reading with listening requirements in certain jobs or training situations would motivate the lower-aptitude men to study. Work completed in FY 1968 indicates that these men can obtain some factual information as well through listening as through reading. More than three-fourths of the lower-aptitude men examined report that they get most of their information through listening rather than reading.

Further work in FY 1968 has involved selecting MOSSs to be included in Work Unit REALISTIC, compiling scientific information relevant to the Work Unit, determining data that needs to be obtained from the U.S. Army Data Support Command, and corresponding with agencies interested in REALISTIC.

- d. FY 69 Projection. In Sub-Unit I, skill levels of personnel in the areas of reading, listening, and arithmetic will be assessed. Job proficiency measures will be developed and testing will be done. In Sub-Unit II, literacy and arithmetic skill levels called for by existing materials of the selected MOSSs will be evaluated. Selected materials will be simplified or modified and the usefulness of the modified materials will be evaluated. Experimental studies of basic perceptual processes involved in reading and listening and of techniques and methods for literacy training will be undertaken in Sub-Unit III. Use of time compressed or expanded speech will also be studied.

5. Estimated Professional Man-Years Required:

FY 69: 4.5
FY 70: 3.0

6. Interested Agencies:

U.S. Continental Army Command
United States Armed Forces Institute (USAFI)
Department of Labor
Office of Economic Opportunity
Department of Health, Education, and Welfare

7. Work Sub-Unit Summary and Forecast:

I. Assessment of skill levels in reading, listening, and arithmetic:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*PCS	PCA	PCA	CA	CA	CA	A	

II. Evaluation and modification of listening and arithmetic skill levels for selected MOSSs:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PCA	PCA	PCA	PCA	CA	CA	AD	DS

III. Experimental studies of basic perceptual processes and training techniques in reading and listening:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PCA	PCA	PCA	PCA	PCA	AD	DS	

WORK UNIT STATEMENT

1. Curriculum Engineering to Enhance the Soldier's Resistance to Stress in Combat and Hazardous Job Situations—SKILLCON (Continuing)

2. Location: HumRRO Division No. 3 (Recruit Training)

3. Sponsor: U.S. Continental Army Command

4. Scope:

- a. Objectives of Research. To apply the training concepts presented in HumRRO Technical Report 66-12 to selected areas of hazardous duty training in order to improve training capacity to strengthen the individual's resistance to stress in the duty situation, and to develop guidelines or procedures to enable Army trainers to improve training in other areas of hazardous duty performance.
- b. Potential Military Research End-Result. This research will result in newly engineered training geared to better prepare soldiers for selected areas of hazardous duty performance. The improvements will be available for implementation during the course of the research. The end product will be procedures for Army instructors that will allow them to apply the training concepts to a wide range of combat and hazardous duty training.

- c. Background and Summary. The concepts concerning stress-retardant training reported in HumRRO Technical Report 66-12, A Conceptual Model of Behavior Under Stress, With Implications for Combat Training, June 1966, were considered significant by the U.S. Continental Army Command (USCONARC), and it requested HumRRO to follow up the original effort by applying the concepts in training experiments.

Hand grenade training in Basic Combat Training (BCT) was the first area chosen for application of the training proposals. In SKILLCON I, data were collected on three control and two experimental companies, and the effects of the revised training on skills, knowledges, and attitudes were evaluated.

- d. FY 69 Projection. With final reporting, SKILLCON I will be completed. Consideration will then be given to further research.

5. Estimated Professional Man-Years Required:

FY 69: 0.5

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel, Department of the Army
U.S. Army Infantry School

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SKILLCON

7. Work Sub-Unit Summary and Forecast:

I. Stress-retardant training for hand grenade performance:

FY 69

1 2 3 4

*S			
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WORK UNIT STATEMENT

1. Training Methods for Forward Area Air Defense Weapons—SKYFIRE (Continuing)
2. Location: HumRRO Division No. 5 (Air Defense)
3. Sponsor: U.S. Army Combat Developments Command
4. Scope:
 - a. Objectives of Research. To determine man's capabilities to perform the operator skills required by forward area air defense weapons, and to identify effective training concepts for developing the required skills.
 - b. Potential Military Research End-Result. Research resulting in training procedures that reduce the human error in various perceptual and tracking tasks required of the gunner will ultimately increase weapon system effectiveness. Many forward area air defense weapon systems require several basic visual and psychomotor skills for accurate and efficient operation, and performance variations among gunners are the largest source of error in system performance.

Greater accuracy from training on range determination skills will increase system effectiveness in several ways:

- (1) Ammunition will be conserved if gunners fire only when the target is within range of the weapon.
- (2) The probability of obtaining a hit will be increased if gunners fire only while the target is within range.
- (3) In weapon systems requiring target range information for accurate lead determination, improved range determination training procedures will result in increased accuracy in the computation of lead.

Information that will be obtained on gunner tracking performance will have implications not only for training, but possibly for engagement doctrine. There will be indications of which targets to engage and which not to engage because of the tremendous errors that might exist under certain conditions. Performance measurements that have been and will be obtained are needed by several agencies involved in computer gaming efforts; the U.S. Army Combat Developments Command Air Defense Agency (USACDCADA) continually has a need for such information.

- c. Background and Summary. There is widespread concern within the Army about man's ability to perform the functions necessary in operating forward area weapons. HumRRO responded to a request from USACDCADA to determine these human capabilities and to develop procedures for training operators of forward area air defense systems. Several field tests of aircraft detection, range estimation, and auditory tracking were conducted.

In addition, human factors assistance was given Joint Task Force Two (JTF-2) in designing and testing forward area air defense systems

SKYFIRE

(TESTAID). In support of two U.S. Army Infantry School requests, assistance was also provided in examining the skills required of Infantry personnel when using small arms in an air defense role, and developing miniaturized training facilities to teach the skills necessary for engaging aerial targets. The research and test results from both JTF-2 and Infantry School support work furthered the objectives of SKYFIRE I and SKYFIRE II.

During FY 1968, a complete analysis of the range estimation data collected in the earlier field tests led to a reorientation of the SKYFIRE I program. Although all range estimation training procedures have been found to reduce ranging errors, the use of a simple job aid employing the occlusion technique produced the best and most consistent range determination performance. It was, therefore, proposed that a study be conducted in SKYFIRE I to determine job aids that could be used with each visually dependent air defense system.

The manual skills needed by the air defense gunner have been emphasized in SKYFIRE II research, with an aim of determining the most effective training methods for the various techniques of fire used by various weapon systems. During FY 1968, an analysis of the Chaparral weapon system was begun as the first phase in analyzing performance in air defense weapon systems.

- d. FY 69 Projection. After finishing development of ranging techniques for the various weapons used in the forward area in an air defense role, SKYFIRE I will begin studying visual search, altitude, and speed estimation behavior. These three areas cover more of the perceptual skills required of forward area air defense personnel.

SKYFIRE II research will be concentrated on examining target tracking performance required for various weapon system operations. The study of the use of various firing techniques will continue in conjunction with work under TESTAID.

5. Estimated Professional Man-Years Required:

FY 69: 4.0

FY 70: 4.0

6. Interested Agencies:

Office of the Assistant Chief of Staff for Force Development,
Department of the Army
Office of Personnel Operations, Department of the Army
U.S. Army, Europe
U.S. Army Combat Developments Command Air Defense Agency
U.S. Army Combat Developments Command Infantry Agency
U.S. Continental Army Command
U.S. Army Infantry School
U.S. Army Air Defense School
U.S. Army Human Engineering Laboratories
Weapon System Evaluation Group
Institute for Defense Analyses
Sandia Corporation

7. Work Sub-Unit Summary and Forecast:

I. Perceptual performance skills:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*AD	D	P	CAD				

II. Marksmanship training for aerial targets:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*PD	CA	PCA	CA				

WORK UNIT STATEMENT

1. Development of Efficient Training Across All Aptitude Levels—SPECTRUM (Continuing)
2. Location: HumRRO Division No. 3 (Recruit Training)
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research. To develop procedures for selecting and organizing training content and training methods for high-density combat and combat support MOSs in order to achieve more efficient training at all aptitude levels.
 - b. Potential Military Research End-Result. SPECTRUM studies will provide information on how training should be designed for men of differing aptitude levels. With the Army's training population now spread so widely across the spectrum of aptitude, there is growing evidence that differential training is necessary for the efficient production of relatively standard MOS-qualified soldiers, but practically no information is available on designing such training.
 - c. Background and Summary. Since the Department of Defense instituted Project 100,000 in October 1960, the Army has been accepting recruits with AFQT scores ranging from 10 (the statutory minimum) to 100 (the highest possible). All these men must be trained in a wide variety of MOSs. The Army now has a greater concentration of trainees at the lower levels of aptitude. These trainees are being assigned to the MOSs where advanced training or school requirements present the least barriers—primarily the combat and combat support rather than the technical MOSs. Approximately two-thirds of the graduates of Basic Combat Training (BCT) enter Advanced Individual Training (AIT) to be trained in the combat or combat support MOSs.

In the combat MOS training context considerable research and development has been done, but there has been little work on designing training for men at particular aptitude levels, especially the lowest. Research is also needed on the routine training problems to be found in the combat support MOS school context, and on the special training problems that may arise as a result of lowering mental standards.

A variety of combat support MOS school courses were studied in SPECTRUM I. The general finding was that the present wide range of input aptitude is putting serious strain on the system. Efficiency is being reduced with the input of low mental level trainees, and it is anticipated that these problems will grow worse with continued or increased input of low-aptitude people.

In SPECTRUM II, the performance of trainees of high, middle, and low aptitude in learning a variety of military tasks was assessed in a series

SPECTRUM

of controlled laboratory studies. Learning performance was found to be highly related to aptitude, with low-aptitude trainees requiring an average of two to three times as long to learn as high-aptitude trainees. This relationship held across a variety of tasks.

Utilizing a miniaturized military training sequence of approximately three to four days' duration, a series of controlled studies will be run in SPECTRUM III to determine the relationships of a variety of training method variables with selected combinations of aptitude level and type of task. These studies will provide information on properly selecting training content and training method for most efficiently training men of all aptitude levels in combat and combat support MOSs.

- d. FY 69 Projection. The findings of SPECTRUM I and II will be reported. The SPECTRUM III miniaturized training sequence will be constructed of a number of selected training tasks from the high-density combat and combat support MOS training programs. The tasks will be selected so that they are representative of a broad range of task complexity (or difficulty). They will be assembled into an interrelated, progressively developing, three-to-four-day training sequence.

A series of studies will be initiated in which each study will determine the effects of the manipulation of a particular set of training methods variables. Some examples of variables to be manipulated are pace of instruction, lecture/practice ratios, role of the instructor, self-instruction, and language level of content. Data will be collected on the performance of trainees of high, middle, and low aptitude as they learn to perform the different tasks under the various training methods. The collected data will be analyzed on a continuing basis as the series of studies progresses. Interim reports of findings will be submitted as significant generalizations emerge.

5. Estimated Professional Man-Years Required:

FY 69: 4.0

FY 70: 3.0

6. Interested Agencies:

Office of Personnel Operations, Department of the Army
Deputy Chief of Staff for Individual Training, U.S. Continental
Army Command
U.S. Army Training Centers
U.S. Army, Europe
U.S. Army Forces Southern Command
Office of the Provost Marshall General, Department of the Army
Department of Labor
Office of Economic Opportunity
Department of Health, Education, and Welfare

7. Work Sub-Unit Summary and Forecast:

- I. AIT school training for combat support MOSs: Completed.
- II. Laboratory studies of the relationship of aptitude to learning performance: Completed.
- III. Relationships of training methods variables with trainee aptitude and task complexity:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*PCA	CA	CA	AD	D	D	DS	

WORK UNIT STATEMENT

1. Aircraft Recognition Training—STAR (Continuing)

2. Location: HumRRO Division No. 5 (Air Defense)

3. Sponsor: U.S. Continental Army Command

4. Scope:

- a. Objective of Research. To develop concepts of aircraft recognition training suitable for personnel manning all forward area air defense weapons.
- b. Potential Military Research End-Result. Since many air defense weapons to be deployed in the forward area depend upon visual recognition for identifying aircraft, effective and efficient programs for initial, refresher, and updating training are needed if high proficiency is to be established and maintained. In addition to developing training, the research will develop information concerning the limits of human ability to recognize aircraft, thus providing a basis for designing and deploying forward area air defense weapons.

- c. Background and Summary. Both the U.S. Continental Army Command and the U.S. Army Combat Developments Command have expressed the need for improved concepts of training aircraft recognition. Under STAR I, several approaches to classroom training were examined and training experiments conducted. A complete prototype classroom program for teaching recognition of 18 fighter-attack aircraft was developed.

In FY 1968, studies were conducted toward determining the minimum number of views required during training for uniform post-training performance. Also, preliminary information on the retention of recognition skill was obtained and a short self-study printed program was developed as a vehicle for subsequent research evaluation. The final work in STAR I was an experiment to determine how various image-pairing strategies during training affected end-of-training performance.

Also during FY 1968, the proposal for an aircraft recognition field test (STAR II) was again submitted to potentially interested agencies.

- d. FY 69 Projection. Efforts will be continued to obtain sponsorship and support for an aircraft recognition field test (STAR II). In STAR III the small self-study printed program will be refined in a series of studies which will lead to the development of a full-scale prototype printed program. A series of studies will be conducted in STAR IV on the retention of recognition skill, including refresher and updating training.

5. Estimated Professional Man-Years Required:

FY 69: 3.5

FY 70: 5.0



44

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel,
 Department of the Army
 Office of the Assistant Chief of Staff for Force Development,
 Department of the Army
 Office of Personnel Operations, Department of the Army
 U.S. Army Forces Southern Command
 U.S. Army Combat Developments Command Air Defense Agency
 U.S. Army Air Defense Center
 U.S. Army Air Defense School
 U.S. Naval Training Device Center

7. Work Sub-Unit Summary and Forecast:

I. An interim aircraft recognition training program: Completed.

II. A field test of recognition performance:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*P	CA	CAP	AD	DS			

III. A printed, individualized aircraft recognition training program:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PCA	PCA	PCA	PCA				

IV. Retention of aircraft recognition skill and refresher and updating training:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PCA	PCA	CA	AD				

WORK UNIT STATEMENT

1. Development of Improved Training for Combat Support Training—SUPPORT (Continuing)
2. Location: HumRRO Division No. 3 (Recruit Training)
3. Sponsor: U.S. Continental Army Command
4. Scope:
 - a. Objective of Research. To develop improved individual training programs for Combat Support MOSs through human factors research on training objectives, content, methods, and procedures.
 - b. Potential Military Research End-Result. This research will contribute to the improvement of certain training programs for military occupational specialties (MOSs) within the responsibility of U.S. Army Training Centers. Potential benefits are:
 - (1) Development of an improved course for Radio Operator (MOS 05B20) trainees in the continental United States (CONUS).
 - (2) Development of an integrated BCT/AIT program at the U.S. Army Medical Training Center.
 - (3) Savings in training time and costs through reductions in such factors as school attrition rates and transportation costs.

- c. Background and Summary. In response to a USCONARC requirement for research to improve courses in several MOS areas in the Combat Support training programs, HumRRO is conducting a series of studies in Work Unit SUPPORT on different areas of training. Initially, in Technical Advisory Service, HumRRO developed a two-week tactical training prototype program for the Combat Support trainee in Basic Combat Training.

In SUPPORT I, an experimental improved Radio Operator (05B20) course was designed using a systems engineering approach. The course was started at Fort Ord, California, in October 1967. Preliminary results indicate (1) a significant reduction in overall attrition rates, including Category IV personnel, (2) a more efficient utilization of training time, and (3) a possible reduction in the overall length of the course.

In studying in SUPPORT II the effect of an integrated Basic Combat Training/Advanced Individual Training (BCT/AIT) sequence on the Medical Corpsman (MOS 91A10) training program, a systems engineering approach to the design of training was also used. The test was conducted at the U.S. Army Medical Training Center, Fort Sam Houston, Texas. Preliminary results indicate (1) the feasibility of an integrated BCT/AIT concept, (2) the possibility of adopting new instructional techniques in the use of television, and (3) the likelihood of substantial savings in transportation costs for moving trainees from BCT centers to AIT centers.

SUPPORT

- d. FY 69 Projection. The findings of SUPPORT I and II will be reported. Upon request, assistance will be provided to the U.S. Army Southeastern Signal School, Fort Gordon, Georgia, in implementing SUPPORT I and to the U.S. Army Medical Training Center in implementing SUPPORT II.

5. Estimated Professional Man-Years Required:

FY 69: 0.5

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel, Department of the Army
Office of the Surgeon General, Department of the Army
Deputy Chief of Staff for Individual Training,
U.S. Continental Army Command
U.S. Army Training Centers
U.S. Army Southeastern Signal School

7. Work Sub-Unit Summary and Forecast:

I. Improved training for the Radio Operator (MOS 05B20) course:

FY 69

1 2 3 4

*D	DS		
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II. Effect of an integrated BCT/AIT sequence on the Medical Corpsman (MOS 91A10) training program:

FY 69

1 2 3 4

*D	DS		
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WORK UNIT STATEMENT

1. Modernization of Synthetic Training in Army Aviation—SYNTRAIN
(Continuing)
2. Location: HumRRO Division No. 6 (Aviation)
3. Sponsor: Chief of Research and Development, Department of the Army
4. Scope:
 - a. Objective of Research. To expedite the application of advances in training technology to the design of Army aviation synthetic training equipment, through surveys of training device design requirements and technology and the conduct of human factors and training research.
 - b. Potential Military Research End-Result. This Work Unit should facilitate the acquisition of modern synthetic aviation training equipment and programs, thus increasing the efficiency of flight training programs and the responsiveness of the aviation training base.
 - c. Background and Summary. The lag which typically exists between developments in training technology and their application in the design of major Army synthetic flight training equipment is of concern to OCRD, the U.S. Continental Army Command, and the U.S. Army Aviation School. At present, a Synthetic Flight Training System (SFTS) is being developed which will close the gap between advances in technical training concepts and their application in rotary wing synthetic training equipment.

HumRRO Work Unit ECHO research was instrumental in initiating the SFTS, and the research staff of SYNTRAIN has continued to provide technical human factors and training information and assistance to the SFTS developing and reviewing commands and participating contractors. Similar attention to the application of technical training advances to the design of fixed wing and tactics synthetic trainers is under way to enable Army aviation to benefit more rapidly from its investment in human factors and training research. Special attention has been given to the development of device requirements for the AH-56A helicopter. Paper procedures trainers, by-products of Work Unit SYNTRAIN, have been adopted by the U.S. Army Aviation School.

SYNTRAIN's approach to expediting the application of modern training concepts to major synthetic trainers design is to follow the six developmental steps proving appropriate for SFTS: (1) familiarization with the training requirements, to identify areas where the use of synthetic trainers is indicated; (2) familiarization with training, training management, and engineering technologies relevant to synthetic trainer design, to identify concepts and techniques applicable to the training requirements; (3) specification of the characteristics of required synthetic training devices and programs; (4) provision of technical assistance to the using, reviewing, and developing commands, to assure that the advanced technical concepts of the proposed synthetic trainers are preserved during the development

SYNTRAIN

cycle; (5) identification of gaps in the human factors and training data, and the conduct of research studies to develop these data; (6) evaluation of prototype training devices to ensure their suitability to the training requirement.

Five Sub-Units are planned, each dealing with a major area of Army aviation training: rotary wing, fixed wing, tactics, maintenance, and air traffic control. The six developmental steps will be followed in each Sub-Unit except where prior research has provided the required information.

- d. FY 69 Projection. SFTS Concept Formulation Studies completed during FY 1968 identified requirements for human factors and training data not currently available. These data will be developed. In addition, fixed wing synthetic trainers that the Aviation School is planning to procure will be evaluated, and an experimental training program for use with them will be developed. The development of synthetic trainer characteristics for the AH-56A, including both flight and tactical aspects, will continue.

5. Estimated Professional Man-Years Required:

FY 69: 3.0

FY 70: 4.0

6. Interested Agencies:

U.S. Continental Army Command
U.S. Army Aviation School
U.S. Army Human Engineering Laboratories
U.S. Army Avionics Laboratory
U.S. Army Aeromedical Research Unit
U.S. Naval Training Device Center
U.S. Air Force Aerospace Medical Research Laboratory
U.S. Air Force Air Training Command
Federal Aviation Administration
National Aeronautics and Space Administration
Various nongovernment research agencies and industries where research and development related to synthetic trainer design and utilization is under way.

7. Work Sub-Unit Summary and Forecast:

I. Synthetic rotary wing training:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*PC	C	CA	CA	CA	CA	CA	CA

II. Synthetic fixed wing training:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*P	P	C	C	CA	CA	CA	CA

III. Synthetic tactics training:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*P	C	C	CA	CA	CA	A	A

IV. Synthetic maintenance training: To be determined.

V. Synthetic air traffic control training: To be determined.

WORK UNIT STATEMENT

1. Improving Aviation Maintenance Training Through Task and Instructional Analysis—UPGRADE (Continuing)
2. Location: HumRRO Division No. 6 (Aviation)
3. Sponsor: U.S. Continental Army Command
4. Scope:
 - a. Objectives of Research. To construct a model instructional development system for aviation maintenance training. Specifically, to develop techniques for gathering task data and procedures for translating the data into effective training programs, and to develop techniques to assist in the definition of school and unit training responsibilities.
 - b. Potential Military Research End-Result. UPGRADE will provide general techniques for increasing the job relevance of aviation maintenance training and will make specific application of those techniques within the high-density MOS 67N20. Job relevance—of prime concern to all Army training—is perhaps most critical in the technical training areas such as aviation maintenance. In view of the fact that (1) the reenlistment rate for aviation mechanics is low and (2) large numbers of aviation maintenance trainees go directly from school to Vietnam, a substantial portion of the Army's aviation maintenance in Vietnam is performed by inexperienced personnel. Therefore, it is especially critical that school training be maximally responsive to major job requirements.
 - c. Background and Summary. Aircraft maintenance is a critical aspect of air mobility, and the effectiveness with which it is performed is largely determined by the effectiveness of the training given and the extent to which the training relates to field job requirements. The continuing need for improving aviation maintenance training has been recognized by a number of Army agencies, including the U.S. Army Aviation and Transportation Schools which administer MOS 67N20 training, the U.S. Continental Army Command (USCONARC), and the Board of Inquiry on the Army Logistics System (Brown Board). The present research on techniques to make maintenance training more job relevant was requested by the Aviation School. It recommended that MOS 67N20 be selected as the vehicle for the study because of its importance to Army aviation operations in Vietnam. The research was coordinated with the Transportation School, the proponent agency for 67N20 training curriculum development.

The establishment of the Military Occupational Information (MOI) Data Bank by the Office of Personnel Operations, Department of the Army, and the issuance of USCONARC Regulation 350-100-1, Systems Engineering of Training, provide specific means for increasing the job relevance and the effectiveness of Army training. The research in UPGRADE has been designed to provide in-depth information on techniques for gathering and utilizing job data in aviation maintenance curriculum construction.

RESEARCH PLAN BLANK

UPGRADE

In UPGRADE I, techniques were developed for collecting and utilizing detailed aviation maintenance job data. A worldwide survey of job incumbents and supervisors of MOS 67N20, by mail and on-site questionnaires, was begun during FY 1968. In addition, field returnees were surveyed, and ongoing maintenance was observed on-site. Survey work in Vietnam was interrupted by enemy activity, but will be completed as soon as conditions permit.

UPGRADE I is also concerned with developing mathematical models to assist in the allocation of task training responsibilities between schools and field units. Such models are necessary to allow computer handling of the voluminous task data outputs from sources such as the MOI Data Bank.

In the original research plan, the UPGRADE II effort was to be concentrated on developing procedures for translating task data into school instructional programs. However, CONARC Regulation 350-100-1 now provides excellent general guidance for this process, so UPGRADE has been redirected. As the Aviation and Transportation Schools apply the systems-engineering concepts required by the USCONARC regulation to their aviation maintenance training curriculums, UPGRADE I data will be made available and implementing Technical Advisory Service will be provided as necessary. During this systems-engineering process, attention will be given to identifying problem areas which may require further research.

Research on unit maintenance training requirements, originally planned as UPGRADE III, will now be accomplished in UPGRADE II. The development of a unit training package which recognizes the capabilities of operational units to conduct maintenance training will fill an important place in the overall aviation maintenance training system. The data and techniques developed in UPGRADE will be useful in producing a systems-engineered program of instruction for MOS 67N20. Equally important, the data will provide the depth of information necessary for evaluation and modification of job data acquisition procedures by the MOI Data Bank. In addition, the data will be of use in the development of supporting guidance documents for systems engineering of training.

- d. FY 69 Projection. The field survey will be completed and the data processed. Mathematical models to assist in allocating the functions of school-unit training will be developed and applied to the data. The translation of job data into instructional programs will begin in conjunction with the Aviation and Transportation Schools. Work on the development of unit training will begin.

5. Estimated Professional Man-Years Required:

FY 69: 4.0

FY 70: To be determined.

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel,
Department of the Army
Office of the Deputy Chief of Staff for Logistics,
Department of the Army

Office of Personnel Operations, Department of the Army
 U.S. Army Materiel Command
 U.S. Army Combat Developments Command
 U.S. Army Aviation School
 U.S. Army Transportation School
 U.S. Air Force Air Training Command
 U.S. Naval Air Technical Training Command

7. Work Sub-Unit Summary and Forecast:

I. Techniques for development and utilization of aviation maintenance
 job description data:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*CA	A	AD	D	S			

II. Development of a unit training package for MOS 67N20:

FY 69				FY 70			
1	2	3	4	1	2	3	4
		PCA	A	A	D	D	S

WORK UNIT STATEMENT

1. Study of Men in Lower Mental Categories: Job Performance and the Identification of Potentially Successful and Potentially Unsuccessful Men--UTILITY (Continuing)
2. Location: HumRRO Division No. 3 (Recruit Training)
3. Sponsors: Assistant Secretary of Defense (Manpower)
Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objectives of Research. Using selected MOSs, to determine how men in Mental Category IV and men in other mental categories compare both in the performance of their jobs and in their overall suitability for military service, to identify characteristics of men in Category IV that are associated with successful performance on the job; and to determine what background and other non-intellectual measures might prove useful in screening, classifying, and assigning such men.
 - b. Potential Military Research End-Result. One product will be an evaluation of the relative effectiveness in job performances of men in Category IV. Selection and assignment policies, as well as any future consideration of the wider utilization of these men, depend upon getting satisfactory, objective information about how well soldiers of lower mental ability actually perform on the jobs to which they are assigned, and how their performances compare with those of other men. To the extent that the variables used in this study discriminate successful from unsuccessful men in Category IV, they will be useful in future selection and assignment.
 - c. Background and Summary. Currently, the Army's means for selecting and assigning men in lower mental categories to jobs are almost wholly through aptitude test scores and school achievement. There is considerable evidence, however, that such cognitive and intellectual characteristics are of secondary significance in situations where cognitive demands are low. In those jobs that make few verbal and abstract intellectual demands upon the worker--jobs to which men of low mental level tend to gravitate--success may depend far more on motivational, attitudinal, and other noncognitive characteristics of the workers than upon their abstract verbal abilities.

Prior research under this Work Unit has consisted of:

- (1) Studies of the nature of successful and unsuccessful performance in jobs that utilize men of lower mental ability.
- (2) Analysis of job requirements and input characteristics of a variety of high-density MOSs leading to the selection of specific MOSs for study.
- (3) Development of job sample tests, job knowledge tests, and other criterion instruments for assessing job and overall military proficiency.
- (4) Exploratory studies of background variables and the development of experimental instruments for predicting job and military effectiveness.

UTILITY

- d. FY 69 Projection. Studies will be made of men in mental Category IV and a random selection of similarly assigned men in other mental categories performing in the following MOSs:

MOS 11E Armor Crewman
 63C General Vehicle Repairman
 76Y Unit and Organization Supply Specialist
 91B Medical Specialist
 94B Cook

Information obtained from military records, tests, questionnaires, and checklists will cover their cognitive and noncognitive characteristics, personal history, adaptation to job, and adaptation to military life. Job sample tests and job knowledge tests will be used to determine and compare their effectiveness in the job. Peer and supervisor ratings will be used to provide further information on their social, motivational, and military characteristics.

The primary data collection began late in FY 1968 and will continue into FY 1969. Then the data will be analyzed and reporting will begin. During this time, interim briefings will be given to the sponsor.

5. Estimated Professional Man-Years Required:

FY 69: 2.0

6. Interested Agencies:

Office of the Deputy Under Secretary of the Army for Manpower
 Office of Personnel Operations, Department of the Army
 Office of the Provost Marshall General, Department of the Army
 U.S. Continental Army Command
 U.S. Army Behavioral Science Research Laboratory
 Department of Labor
 Department of Health, Education, and Welfare
 Office of Economic Opportunity

7. Work Sub-Unit Summary and Forecast:

1. Men in lower mental categories: Job performance and identification of potentially successful and unsuccessful men:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*C	A	D	D	DS			

EXPLORATORY RESEARCH STUDY

1. Title: Manual Format—ES-58 (New)
2. Location: HumRRO Division No. 1 (System Operations)
3. Sponsor: Deputy Chief of Staff for Logistics,
Department of the Army
4. Scope:
 - a. Objectives of Research. To prepare a state-of-the-art review of the methods and techniques for designing and formatting field and technical manuals, giving special attention to (1) describing those design methods and manual formats whose effectiveness seems to be firmly supported by experimental and/or usage data; and (2) defining those areas of manual design and format that are in need of further investigation. Attention will also be given to (1) exploring the feasibility of developing audio-visual technical manuals for use on joint Army-Navy equipment, and (2) attempting to determine the degree to which concept embodied in the 21-100 series of field and technical manuals is being followed or is still valid. Finally, a course of research action will be developed for improving technical manuals.
 - b. Military Problem. The Board of Inquiry on the Army Logistics System (Brown Board) has recommended that research be undertaken to "develop methods and techniques of designing field manuals so that two-year soldiers can be easily trained to understand the supply, maintenance, and transportation procedures within the combat division." This concern over the inability of enlisted men to comprehend and effectively utilize existing field and technical manuals has prompted research requests from the Office of the Deputy Chief of Staff for Logistics and the Office of the Deputy Chief of Staff for Personnel, Department of the Army; the U.S. Army Ordnance Center and School; the U.S. Continental Army Command; the U.S. Army Materiel Command; and the U.S. Army Combat Developments Command.
 - c. Approach. The Study was proposed in the FY 1968 Work Program, but the funding for it did not materialize. In FY 1969, plans for the Study are to review (1) techniques developed by Army schools, equipment manufacturers, and research agencies for displaying information via printed and audio-visual media; (2) practices of grammar and vocabulary that lead to a comprehensible style of writing; (3) techniques for structuring and organizing various types of technical material; and (4) the various ways in which logistics manuals are utilized in the field.
5. Estimated Professional Man-Years Required:
FY 69: 1.5

6. Interested Agencies:

Office of the Deputy Chief of Staff for Logistics,
Logistics Doctrine and Systems Office
Office of the Deputy Chief of Staff for Personnel, Department
of the Army
Office of the Assistant Chief of Staff for Force Development, Department
of the Army
Office of Personnel Operations, Department of the Army
U.S. Army Materiel Command
U.S. Army Combat Developments Command
U.S. Continental Army Command
U.S. Army Chemical Center and School
U.S. Army Ordnance Center and School

BASIC RESEARCH STUDY

1. Title: Visual Pattern Discrimination—BR-16 (Continuing)
2. Location: HUMRRO Division No. 5 (Air Defense)
3. Sponsor: U.S. Army Combat Developments Command
4. Estimated Professional Man-Years Required:
FY 69: 2.0
5. Many military tasks involve visual recognition or identification of objects or shapes. A few examples of such tasks are: visual aircraft and land vehicle identification; mapreading and land navigation; air-to-ground reconnaissance and navigation, and photographic radar and infrared image interpretation. In each of these visual tasks, observers must be trained to discriminate between similar shapes and to accurately classify (or identify) shapes that have a wide variety of spatial or geographical orientations. In terms of a taxonomy of psychological skills, shape identification may be classified as consisting of multiple concept formation.

In visual aircraft identification, each type of aircraft constitutes a concept in that the observer must learn to name the aircraft no matter how it is oriented with respect to the observer. That is, a common response—the aircraft's name—must be made to a wide variety and number of visual cues that serve to distinguish each aircraft from all other similar aircraft.

Applied research has been conducted in the past few years concerning methods of training visual pattern discrimination and identification. However, more fundamental research is needed in order to evaluate various methods of teaching these skills, and to understand the relationships between concept attainment and: (a) the information complexity of the visual images; (b) the rate of introduction of similar but different forms for learning, (c) the probabilistic nature of the visual cues used for pattern discrimination; and (d) the types and importance of various types of cues that may be used to characterize different classes of visual patterns involved in such diverse tasks as vehicle recognition and land navigation.

Since pattern discrimination is dependent upon the visual recognition of distinctive features, it is obvious that optical magnification of images will affect identification accuracy by aiding recognition of static objects and perhaps hindering recognition of moving objects when the latter pass into and out of the optical field of view in a short time period. The relationship of identification accuracy to rate of movement of the object or the observer is an important area in itself for systematic study.

During FY 1969, sets of experiments will be conducted to investigate the following fundamental problems:

- (a) The ability of observers to detect cue similarities and differences among a set of shapes having common or redundant characteristics.
- (b) The relationship between concept attainment and the relative probabilities that distinguishing cues are present for viewing.
- (c) The effect on learning rate and transfer to new imagery of the method used for original learning.

- (d) The effect on identification accuracy of viewing time, the amount and the type of feedback provided.
- (e) The joint influence of optical magnification viewing time and object motion upon visual discrimination.

6. Interested Agency: U.S. Continental Army Command

EXPLORATORY RESEARCH STUDY
(Unfunded)

1. Title: Personnel Management Technicians—ES- (New)
2. Location: To be determined
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research. To plan a research program for developing an improved system for training Personnel Management Technicians.
 - b. Military Problem. The established methods of training and utilizing military personnel management staff officers, supervisors, and specialists no longer meet the new requirements for carrying out the technical aspects of the personnel management function. Methods and media for the dissemination of personnel management doctrine and technical material covering the personnel management function are not producing a desired level of effectiveness. Rapid developments in organization and technology governing systems in support of the Army in the field have imposed new requirements related to knowledge of the functioning and execution of personnel management processes.
 - c. Approach. The salient elements of entry preparation for personnel management technicians will be identified. A program of research will be planned, taking into consideration results from Work Unit APSTRAT, for developing a program of instruction that could be used for training both military and civilian personnel. The research will include development of training related to increased use of advanced technology in personnel management, including, but not limited to, automated systems of personnel accounting.
5. Estimated Professional Man-Years Required:
FY 69: 2.0
6. Interested Agency: U.S. Continental Army Command

Research Area 2:
UNIT TRAINING AND PERFORMANCE

Research Area 2:
Unit Training and Performance

Title:

Work Unit

Tank Crew Performance During Periods of Extended Combat (ENDURE)

Exploratory Research Studies

Human Performance Degradation (ES-54)

Logistics Systems (ES-63)

Description:

The main emphasis of the research activities in unit training and performance is in training groups of men to work together effectively in order to attain a designated objective. While training of group members in individual skills will be given attention as necessary, research efforts in this area will concentrate on selected Army activities that require coordinated group performance. In addition to work directly related to team-type training, the research will explore ways in which group organization and interpersonal relations contribute to group effectiveness.

Level of Effort in FY 1969: 7.5 BMVs.

WORK UNIT STATEMENT

1. Tank Crew Performance During Periods of Extended Combat—ENDURE
(Continuing)

2. Location: HumRRO Division No. 2 (Armor)

3. Sponsors: U.S. Army Combat Developments Command Armor Agency
U.S. Army Combat Developments Command Institute of
Advanced Studies

4. Scope:

- a. Objectives of Research. To determine the endurance of troops using combat equipment with a 48-hour capability and, as necessary, to establish ways of extending troops' endurance so that the effectiveness of the equipment will not be limited by the user.
- b. Potential Military Research End-Result. Because tank crewmen participating in this endurance study engage in essentially all of the activities found in combat, the Work Unit will produce performance-deterioration data closely related to what may be expected in actual combat. If performance does not deteriorate in the study, it is reasonable to conclude that it will not deteriorate in an extended combat day. If deterioration does occur, the activities in which it is observed and the time and degree of occurrence will all be specified. If significant deterioration is found, effort can then be directed toward determining what can be done—for example, changes in unit organization or tactical doctrine—to reduce or eliminate the factors responsible for the loss of efficiency.
- c. Background and Summary. Improvements in equipment durability and reliability, and in night vision devices, are expected to provide the potential for around-the-clock fighting capability. When a vehicle with such capabilities is developed, crews able to utilize the vehicle's potential will be needed. Exploratory Study 24 was conducted to conceptualize the problem area of performance decrement as a function of extended operations. A review of literature and military records relating to performance over extended periods of time yielded no direct evidence to either support or deny the thesis that full combat effectiveness can be sustained for 48 hours or longer.

ENDURE I, a laboratory study of the effects of continuous performance on vigilance and tracking (driving), has been completed, except for reporting. ENDURE II is a field study of the effects of continuous 48-hour operations on gunnery, surveillance, driving, maintenance, and communications, in the context of a tactical exercise including offensive, defensive, and retrograde activities, both day and night.

Plans for a field study of the effects of confinement, as ENDURE III, have evolved primarily from requests by the U.S. Army Combat Developments Command and from findings in an earlier consulting report on the status of research on problems of crew fatigue.

ENDURE

- d. FY 69 Projection. ENDURE II will be completed. ENDURE III will begin when the ENDURE II field data have been collected. The field study for ENDURE III will be handled in the same general way as the one for ENDURE II.

5. Estimated Professional Man-Years Required:

FY 69: 3.5

FY 70: To be determined.

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel,
Department of the Army
U.S. Continental Army Command
U.S. Army, Europe
U.S. Army Medical Research Laboratory
U.S. Army Human Engineering Laboratories
U.S. Army Research Institute of Environmental Medicine
Defence Research Board, Canada
Ministry of Defence, United Kingdom

7. Work Sub-Unit Summary and Forecast:

- I. Laboratory studies of performance for extended periods: Completed.
- II. Field studies of performance of combat duties for extended periods:

FY 69

1 2 3 4

AD	D	D	DS
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- III. Field studies of effects of confinement for extended periods:

FY 69

1 2 3 4

FY 70

1 2 3 4

PC	CA	D	D	DS			
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EXPLORATORY RESEARCH STUDY

1. Title: Human Performance Degradation—ES-54 (Continuing)
2. Location: HumRRO Division No. 5 (Air Defense)
3. Sponsor: U.S. Army Combat Developments Command
4. Scope:
 - a. Objective of Research. To provide quantitative information concerning the extent to which air defense effectiveness may be subject to human performance degradation during combat.
 - b. Military Problem. Quantitative measurement of human performance in both visually sighted and radar-directed air defense systems is critical to the needs of the U.S. Army Combat Developments Command Air Defense Agency. It is, however, extremely difficult to obtain such information under actual combat conditions, so HumRRO was asked to undertake a series of studies to collect data.
 - c. Approach. During FY 1968, studies were begun to identify types of air defense functions that might be most subject to degradation as a result of adverse environmental and fatigue effects upon system operators. Testing of selected stress-sensitive operator tasks had been planned, but could not be started because research personnel were needed for activities of higher priority.

During FY 1969, the initial emphasis will be on self-propelled, radar-directed systems, which are characterized by extended mission duty cycles; operators of such systems are subject to adverse working environments such as nonambient temperatures, mechanical shock, and vibration. Small-scale field tests are planned to obtain preliminary estimates of the extent to which performance of selected operator tasks may be degraded under adverse working conditions. The types of tasks studied first will include radar surveillance, voice communication, and routine checks and adjustments.

5. Estimated Professional Man-Years Required:
FY 69: 2.0
6. Interested Agency:
Office of the Deputy Chief of Staff for Personnel,
Department of the Army

EXPLORATORY RESEARCH STUDY

1. Title: Logistics Systems—ES-63 (New)
2. Location: HumRRO Division No. 1 (System Operations)
3. Sponsor: Deputy Chief of Staff for Logistics,
Department of the Army
4. Scope:
 - a. Objectives of Research. To conceive a research program consonant with the following objectives:
 - (1) To study human and man-machine relationships among military teams operating supply applications of computers overseas.
 - (2) To identify problems in selecting, training, staffing, organizing, supervising, and evaluating individual and unit performance.
 - (3) To explore variations of system elements to achieve more effective system performance.
 - (4) To develop a technique for transferring the solution to the general case of military team operation of administrative and decision applications of computers in overseas units.
 - b. Military Problem. Military supply operations in overseas commands are conducted by military rather than civilian personnel. When such systems convert from a manual system to a computerized, or computer-assisted system, problems are encountered in the transition. At the request of the Deputy Chief of Staff for Personnel, Department of the Army, HumRRO proposes to develop a research program to help meet these problems.
 - c. Approach. Preliminary work was conducted on this Study in late FY 1967 and early FY 1968 prior to the time that it became clear that funding for the study was not available. The initial approach was to conduct simulations of both manual and computerized logistics systems in order to become familiar with simulation techniques appropriate to logistics problems.

The emphasis on computer simulation of logistics systems stems from the need to develop the general solution. A particular solution to a problem is possible without computer simulation, but only simulation is thought to provide the flexibility and capacity to evaluate logistics systems.

Additional approaches in formulating a research program will include examining specific problems caused by converting from a manual to a computer system. To administer survey questionnaires, overseas trips may be required to those areas whose systems are in transition.
5. Estimated Professional Man-Years Required:

FY 69: 2.0
6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel, Department of the Army
U.S. Continental Army Command

Research Area 3:

**TRAINING FOR LEADERSHIP,
COMMAND, AND CONTROL**

3

Research Area 3:

Training for Leadership, Command, and Control

Title:

Work Units

Research for Improvement of Infantry Stability Operations Training (ACTION)
Knowledges, Skills, and Thought Processes of the Battalion Commander and Primary Staff (CAMBCOM)
Factors in Organizational Effectiveness (FORGE)
Development of Training for Improving the Combat Skills of Leaders in Small Infantry Units (LEAD)
Determination of Performance Capabilities and Training Requirements for Manual Command and Control Functions of the Sentinel Weapon System (MANICON)

Exploratory Research Study

Troop Information (ES-50)

Description:

Research activities in this area are directed toward increasing understanding of human factors aspects of leadership, command, and control, and studying approaches to officer training. The field of interest covers a range of command, from company and battalion levels in Infantry to command and control in Nike-X, to the problems of combined staffs. The research efforts deal with command and control functions and problems, information requirements and other factors that enter into decision making by the commander, determination of the content for particular courses, and studies of organizational effectiveness.

Level of Effort in FY 1969: 12.0 BMYs.

WORK UNIT STATEMENT

1. Research for Improvement of Infantry Stability Operations Training--
ACTION (Continuing)

2. Location: HumRRO Division No. 4 (Infantry)

3. Sponsor: U.S. Continental Army Command

4. Scope:

- a. Objective of Research. To develop the informational basis for improved infantry stability operations training.
- b. Potential Military Research End-Result. Data obtained by collecting and analyzing accounts of small-unit combat actions in Vietnam should be of substantial value in developing improved and realistic training for individuals and units preparing for Vietnam and, to the extent tactics and techniques employed by the enemy in Vietnam are stylistic, for internal stability operations in general.
- c. Background and Summary. The increasing commitment of U.S. Army forces to internal stability operations has increased the need for information regarding the conditions under which such operations are conducted, and techniques our forces have developed to adapt to these conditions.

At the request of the U.S. Army Infantry School, HumRRO collected interview data in Vietnam on small-unit operations during the fall and early winter of 1966. The data were collected from 11 different battalions from five major commands. Interview subjects consisted of battalion commanders, company commanders, platoon leaders, platoon sergeants, squad leaders, and fire team leaders. The tape-recorded interviews have been systematically organized and made available for use by the Infantry School, the Army Advanced Individual Training Centers, and other requesting activities.

Quantitative data obtained during the interviews on various key items, such as weights and items of equipment carried, distance of enemy at initial engagement, firing positions used, and technique of fire employed, are now being analyzed for presentation in a summary report.

- d. FY 69 Projection. The analysis of the summary data will be finished, and a summary report published.

5. Estimated Professional Man-Years Required:

FY 69: 1.0

6. Interested Agencies:

Office of the Deputy Chief of Staff for Military Operations,
Department of the Army
Office of the Deputy Chief of Staff for Personnel,
Department of the Army

ACTION

Office of the Provost Marshal General, Department of the Army
U.S. Army Forces Southern Command
U.S. Army Infantry School
U.S. Army Combat Developments Command Infantry Agency
U.S. Army John F. Kennedy Center for Special Warfare

7. Work Sub-Unit Summary and Forecast:

1. Study of small-unit stability operations:

FY 69

1	2	3	4
A	D	D	DS

WORK UNIT STATEMENT

1. Knowledges, Skills, and Thought Processes of the Battalion Commander and Primary Staff—CAMBCOM (New)
2. Location: HumRRO Division No. 4 (Infantry)
3. Sponsor: U.S. Continental Army Command
4. Scope:
 - a. Objective of Research. To identify the knowledges, skills, and thought processes of the battalion commander and primary staff officers of a combat arms maneuver battalion.
 - b. Potential Military Research End-Result. Information developed by this Work Unit will enable the U.S. Army Infantry School to:
 - (1) Validate that portion of the Infantry Officer Advanced Course curriculum (2-7-C22) that is currently devoted to battalion commander and staff procedures.
 - (2) Develop a basis for the derivation of Student Performance Objectives for Advanced Course subject matter.
 - (3) Revise doctrinal literature.
 - c. Background. During the past several years the Infantry School has developed a master plan directed primarily toward improving instructional content and procedures. The plan includes the introduction of innovations in technology of instruction, and emphasizes the systematic derivation of training content as a critical first step in establishing an instruction system. As a part of implementing the plan, the Infantry School asked HumRRO to assist in identifying the knowledges, skills, and thought processes of the battalion commander and his primary staff.

Exploratory Study 64, conducted during FY 1968, indicated the feasibility of accomplishing research in this area. Specific methods of identifying knowledges, skills, and thought processes were selected and preliminary background data on the operation of the battalion staff were collected in both the continental U.S. (CONUS) and Vietnam.
 - d. Method of Attack. The knowledges and skills of the primary battalion staff will be identified in CAMBCOM I by using a modified job analysis procedure originally developed by the U.S. Air Force. The primary step in this process is expected to be to develop experimental task inventories for the S-1, S-2, S-3, and S-4 staff positions. Concurrently, the thought processes of the battalion staff will be identified in simulated command post exercises conducted in Work Unit FORGE.
5. Estimated Professional Man-Years Required:

FY 69: 2.0
FY 70: 3.0

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel, Department of the Army
 U.S. Army Infantry School
 U.S. Army Armor School
 U.S. Army Command and General Staff College

7. Work Sub-Unit Summary and Forecast:

I. Identification of the knowledges, skills, and thought processes of the primary battalion staff:

FY 69				FY 70			
1	2	3	4	1	2	3	4
P	CA	CA	CA	CA	A	AD	D

II. Identification of the knowledges, skills, and thought processes of the battalion commander:

FY 69				FY 70			
1	2	3	4	1	2	3	4
							P

WORK UNIT STATEMENT

1. Factors in Organizational Effectiveness—FORGE (Continuing)

2. Location: HumRRO Division No. 4 (Infantry)

3. Sponsor: (Institutional Research)

4. Scope:

- a. Objective of Research. To identify and discover ways of controlling human factors that influence the effectiveness of military organizations.
- b. Potential Military Research End-Result. Specific knowledge will be obtained on the human factors involved in command and control activities and their contribution to organizational effectiveness. Such knowledge will enable commanders to better control their units and will permit improved training in command and control activities. Additional benefits will be improved techniques for assessing organizational functioning and for evaluating the performance of command and control activities.
- c. Background and Summary. Military organizations must be able to search out, accurately perceive, and correctly interpret the properties of operational situations, to solve relevant problems, and to react flexibly to changing situational demands. In addition to the need for technically competent personnel, effectiveness has been found to depend upon the efficient functioning of certain organizational processes for coordinating activities and integrating information and decisions. Whether these processes are effectively handled depends greatly upon certain social-psychological factors that operate to some degree in all organizations.

In FORGE, social-psychological factors that impede or enhance performance of certain processes are being identified and studied. The approach is to simulate an infantry battalion engaged in internal defense operations so as to identify and study the organizational processes used in solving problems and taking actions and the human factors that influence these processes.

Organizational processes identified in previous research are being studied in FORGE I to determine how they contribute to unit effectiveness in accomplishing concrete missions, how they function in military organizations, and how they are affected by the external pressures of combat. Data collection techniques and a standard simulation have been developed, and data have been collected and are being analyzed.

- d. FY 69 Projection. The data analysis in FORGE I will be completed and reported. In FORGE II, those organizational processes that have been identified as major determinants of effectiveness will be studied intensively to isolate social-psychological factors that influence their performance. Simultaneously, planning will begin for FORGE III to develop methods of direct measurement of the variables identified in FORGE I and FORGE II to permit use of the FORGE approach in the study

FORGE

of continuous operations. Work will be initiated to develop a simulate of considerably extended duration to serve as a vehicle for this work.

5. Estimated Professional Man-Years Required:

FY 69: 2.5

FY 70: 3.0

6. Interested Agencies:

U.S. Army Combat Developments Command Institute of
Advanced Studies

U.S. Continental Army Command

U.S. Army Infantry School

U.S. Army Command and General Staff College

U.S. Army War College

U.S. Army Management School

Industrial College of the Armed Forces

7. Work Sub-Unit Summary and Forecast:

I. Identification of functions critical to organizational effectiveness:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*A	A	A	D	D	DS		

II. Human factors affecting performance of critical functions:

FY 69				FY 70			
1	2	3	4	1	2	3	4
		P	P	C	A	A	D

III. Control of factors influencing effectiveness:

FY 69				FY 70			
1	2	3	4	1	2	3	4
						P	P

WORK UNIT STATEMENT

1. Development of Training for Improving the Combat Skills of Leaders in Small Infantry Units—LEAD (Continuing)
2. Location: HumRRO Division No. 4 (Infantry)
3. Sponsor: U.S. Continental Army Command
4. Scope:
 - a. Objective of Research. To improve officer training in the critical skills required for effective combat leadership in small infantry units.
 - b. Potential Military Research End-Result. Work Unit LEAD will result in the development of lists of critical combat performances, knowledges, and skills in various content areas critical to effective combat performance by the Infantry Rifle Platoon Leader (IRPL). These lists will make a major contribution toward developing student performance objectives for the Infantry Officer basic course at the U.S. Army Infantry School. They will also furnish a basis for designating the critical knowledges, skills, and performances that must be acquired on the job, after completing the Infantry Officer's basic course.
 - c. Background and Summary. In response to changes in educational technology that have occurred during the past several years, the Infantry School has developed a forward-looking master plan for systematically incorporating into its programs both technical and content advances in the state of the educational art. As a significant part of this effort, the School has sought to identify appropriate terminal performance objectives and student performance objectives for its various courses.

In this Work Unit, HumRRO has been collecting data to identify critical combat knowledges and skills of the IRPL. From the data, 46 content areas were identified that are critical to his effective combat performance. The critical knowledges, skills, and performances for 41 of these content areas have now been identified and submitted to the Infantry School for coordination and incorporation into the Infantry Officer's basic course. The remaining five areas have been deleted from the list with the concurrence of the School. A volume of Small Unit Combat Actions that will provide the instructor with extensive background material for classroom instruction is being prepared.
 - d. FY 69 Projection. The volume of Small-Unit Combat Actions will be completed and final reporting accomplished.
5. Estimated Professional Man-Years Required:

FY 69: 0.5

LEAD

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel,
Department of the Army
Office of Personnel Operations, Department of the Army
U.S. Army Combat Developments Command
U.S. Army, Europe
U.S. Army Infantry School
U.S. Army Behavioral Science Research Laboratory

7. Work Sub-Unit Summary and Forecast:

I. Critical combat leadership skills:

FY 69			
1	2	3	4
*AD	DS		

WORK UNIT STATEMENT

1. Determination of Performance Capabilities and Training Requirements for Manual Command and Control Functions of the Sentinel Weapon System—MANICON (Continuing)
2. Location: HumRRO Division No. 5 (Air Defense)
3. Sponsor: Sentinel System Evaluation Agency (SENSEA),
White Sands Missile Range, New Mexico
4. Scope:
 - a. Objective of Research. To identify and evaluate manual performance capabilities and training requirements for command and control functions within the Sentinel weapon system, in support of the activities of the Sentinel System Evaluation Agency (SENSEA).

- b. Potential Military Research End-Result. The decision to deploy the Sentinel system has accelerated the need to assess manual command and control functions. The MANICON research effort has already had an impact on Army decisions concerning allocation of man/machine functions, command positions, and the characteristics of display consoles of the Sentinel system.

As an outgrowth of these efforts, the sponsor has begun building a large-scale simulation facility at White Sands Missile Range that will consist of simulated command consoles and information displays driven by a general purpose computer. The consoles will be modular and will permit manual command and control functions to be experimentally evaluated in a wide variety of system configurations. The sponsor has requested that MANICON assume a responsible role in this evaluation at the sponsor's location. This effort is expected to continue for several years.

HumRRO will continue to provide human factors support to the sponsor's evaluation and efforts to assure maximum effectiveness of man in the system. In addition, a by-product of this Work Unit will consist of command and control task descriptions and associated training requirements, which will be useful in the development of training programs and exercises.

- c. Background and Summary. At the request of the Sentinel System Evaluation Agency (formerly Nike-X Engineering/Service Test Office), HumRRO began evaluating proposed manual command and control functions in the Sentinel system. Under MANICON, several formal analyses were prepared, the products of which included event sequence descriptions, manual task descriptions, postulated command positions, postulated displays and consoles, and preliminary evaluations of the feasibility and necessity of selected manual activities.

In FY 1968, activities under MANICON have included work to develop and integrate long-range test plans, design and execute specific experimental studies, and describe detailed procedures for command and control tasks.

MANICON

These activities are being carried out in close coordination with the sponsor's efforts. In support of the sponsor's simulation program, a variety of pilot studies are being run to pretest task and display concepts to be used with the sponsor's simulator.

A significant portion of MANICON effort involves providing Technical Advisory Service to the sponsor.

- d. FY 69 Projection. The development of test plans for using the simulation facility will continue. In-house pilot studies designed to evaluate man's ability to perform selected engagement management tasks will be undertaken. Attempts to define, delineate, and document the role of man in automated systems will continue.

5. Estimated Professional Man-Years Required:

FY 69: 4.0

FY 70: To be determined.

6. Interested Agencies:

U.S. Army Air Defense Command
U.S. Continental Army Command
U.S. Army Human Engineering Laboratories
U.S. Army Sentinel Central Training Facility
Riverside Research Institute

7. Work Sub-Unit Summary and Forecast:

To be determined.

EXPLORATORY RESEARCH STUDY

1. Title: Troop Information—ES-60 (Continuing)
2. Location: HumRRO Division No. 4 (Infantry)
3. Sponsor: Office of the Chief of Information, Department of the Army
4. Scope:
 - a. Objective of Research. To determine the feasibility of research aimed at evaluating and improving the Army's capability to increase the individual soldier's understanding of the Army and his motivation to perform to the limit of his ability.
 - b. Military Problem. The Army's Command Information Program emphasizes the basic relationship between successful leadership and the need to communicate goals, objectives, and accomplishments. Because the program is a command function, it is specifically designed to provide the local commander with maximum freedom of action in developing and balancing his own training effort. The program is specifically directed toward assisting the soldier to fully comprehend his responsibilities as a citizen, educating him to recognize his military responsibilities, motivating him to fight for his heritage, and making him aware of the Army's goals, both at home and abroad, in peace and war.
 - c. Approach. Scientific literature on mass communication, attitude change, and influence processes will be surveyed in this Study. The assumptions underlying content, methods, and general approach used in the Command Information Program will be examined from a perspective developed from the scientific literature. Researchable questions that most directly relate to the effectiveness of Army capabilities to influence understanding and motivation of individual soldiers will be formulated.
5. Estimated Professional Man-Years Required:

FY 69: 2.0

Research Area 4:
LANGUAGE AND AREA TRAINING

Research Area 4:
Language and Area Training

Title:

Work Units

Development of Concepts and Techniques for Area Training (AREA)
Development of a Generalized Method for Preparing Self-Instructional
Foreign Language Courses (AUTOSPAN)
Development of a Manual for Community Service Volunteers (COMSERVE)
A Program of Instruction for the Development of Cultural Self-
Awareness (COPE)
Feasibility Study of a System for Debriefing MAAG Advisors (DEBRIEF)
Implementation and Modification of the USMACTHAI Advisor
Debriefing Program (REFOCUS)
Factors Influencing Effectiveness of Advisor-Counterpart
Interactions (REFRACT)
Overseas Military Posts and Communities (SOJOURN)

Exploratory Research Study

U.S.-Thai Security Guard (ES-73)

Description:

The general objectives of efforts in this Research Area are to identify and improve training in cross-cultural skills that are important to stability operations in underdeveloped non-Western countries. Studies will be made to determine the cross-cultural skills, knowledges, and attitudes that are most likely to contribute significantly to success in stability operations. Training techniques to teach these cross-cultural attributes will be designed and tested. All research in this Research Area is conducted by Division No. 7 (Language and Area Training).

Level of Effort in FY 1969: 11.0 BMYS.

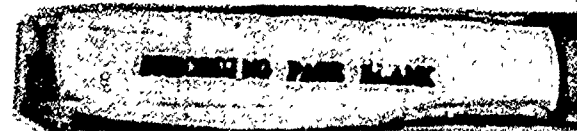
WORK UNIT STATEMENT

1. Development of Concepts and Techniques for Area Training—AREA (Continuing)
2. Location: HUMRRO Division No. 7 (Language and Area Training)
3. Sponsor: Deputy Chief of Staff for Military Operations,
Department of the Army
4. Scope:
 - a. Objective of Research. To increase the effectiveness of area training.
 - b. Potential Military Research End-Result. By expanding the concepts and techniques used in area training, more complete cultural preparation of MAAG (Military Assistance Advisory Group), mission, and mobile training teams operating overseas is possible. The research products are intended to assist military personnel to upgrade the planning, development, and evaluation of area training programs, particularly those components of such programs that concern effectiveness in intercultural communication.
 - c. Background and Summary. Many Army missions involving training and advisory functions take place in less developed areas of the world where cultural settings are different from our own. The missions often require effective social interaction with indigenous personnel who hold different beliefs and values, and who may be less literate, poorly organized and equipped, and lacking in adequate understanding of our purposes and their own capabilities for effective stability operations. Before U.S. personnel leave for these missions, they receive "area training" designed to familiarize them with the background of the host country, but data indicate that the content and techniques of such training require further attention.

In AREA I some concepts and techniques relevant to the conduct of area training were analyzed, and reports dealing with cross-cultural problems, use of human relations training techniques, and resources available for use in area training programs were prepared.

In AREA II, certain aspects of the overseas working situation were simulated to demonstrate how American cultural assumptions and values manifest themselves in the behavior of advisors and cause difficulties in communication with host-country personnel. Experience with the methodology of simulation has laid the groundwork for projected AREA III development of behavioral criteria.

In AREA IV, the knowledge and insight accumulated in Work Units CIVIC, MAP, and earlier phases of AREA were used to develop a tentative conceptualization of area training that could guide the development of programs of instruction and lesson plans.



AREA

- d. **FY 69 Projection.** In AREA III, behavioral criteria will be developed to further assess the training effects of the techniques developed in AREA II, and broaden understanding of the individual capabilities required for effective intercultural work. Realistic situations known to present cross-cultural problems to mission officers will be identified, and adapted to incorporate the desired research properties. Situational data collected from returning MAAG officers interviewed in AREA II and MAP I will serve as initial source material. In subsequent work, these behavioral criteria will be used to assess the effectiveness of various approaches to area training, including the human relation approaches surveyed in AREA I, the simulation exercises developed in AREA II, and the programed audio-visual instructional material being prepared in COPE.

5. Estimated Professional Man-Years Required:

FY 69: 0.5

FY 70: 2.0

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel,
Department of the Army
U.S. Continental Army Command
U.S. Army Behavioral Science Research Laboratory
Center for Research in Social Systems
Military Assistance Institute
Agency for International Development
Peace Corps
Foreign Service Institute

7. Work Sub-Unit Summary and Forecast:

- I. Survey of selected concepts and techniques for area training:
Completed.
- II. Studies of simulation techniques for training military advisors:
Completed.
- III. Development of behavioral criteria:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*C	CA	A	D	CAP	AD	D	DS

- IV. Guidelines for design of area training programs: Completed.

WORK UNIT STATEMENT

1. Development of a Generalized Method for Preparing Self-Instructional Foreign Language Courses—AUTOSPAN (Continuing)
2. Location: HumRRO Division No. 7 (Language and Area Training)
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research. To develop a generalized method for preparing self-instructional, introductory level, foreign language courses. The effort is organized in large part around the development and evaluation of a prototype course in Spanish.
 - b. Potential Military Research End-Result. The prototype course in Spanish to be developed in this Work Unit will be useful in reducing training costs and in providing language training to individuals who cannot be assigned to school courses. The how-to-prepare-courses document, which will be a major product of this Work Unit, should make it easier to construct similar courses in other languages and thus lead to more widespread economies in military language training.
 - c. Background and Summary. The U.S. military services each year provide intensive training in a variety of languages to many men, and virtually all of this training is given by instructors in classrooms, so it is costly. The Army would like to reduce these costs, provided that training quality is retained.

Another problem is the fact that many persons who should receive language training to better prepare them for their next assignment cannot, for various administrative reasons, be assigned to lengthy, full-time courses. A need exists for some means of providing language training to such individuals in a manner and in amounts consistent with the time they have available for study.

In AUTOSPAN I, a tentative set of design specifications for a prototype course was prepared. The objective in AUTOSPAN II was to construct the first half of the prototype course, which would permit evaluating, revising, and finalizing the course design specifications. These activities would facilitate the development of the remainder of the course in AUTOSPAN III, and would also provide the basis for preparing a how-to-do-it document which would constitute an important product of the overall Work Unit.

Construction of Phase I of the prototype course is about 80% completed. The objective in Phase I is to produce language proficiency comparable to the S-1, R-1 level on the Foreign Service Institute scale. The course consists of both text and tape materials and embodies what are believed to be the best features of programmed instruction, modern classroom teaching, and tutorial instruction. As major blocks of the course are

AUTOSPAN

completed, they are being reviewed by an advisory panel of linguists and programing authorities, and empirically evaluated by student try-out.

- d. FY 69 Projection. Phase I of the prototype course will be completed and formally evaluated by administration to a group of military students. Unless major revisions are necessary, AUTOSPAN II will then be considered completed.

Work will begin in AUTOSPAN III on the construction of Phase II of the course, after which the entire course will be evaluated and guidance documents prepared.

5. Estimated Professional Man-Years Required:

FY 69: 2.5

FY 70: 3.0

6. Interested Agencies:

Deputy Chief of Staff for Military Operations, Department of the Army
U.S. Continental Army Command
U.S. Army Behavioral Science Research Laboratory
U.S. Army Security Agency
Defense Language Institute
Foreign Service Institute
Office of Education

7. Work Sub-Unit Summary and Forecast:

- I. Formulation of the design for a self-instructional language course: Completed.

- II. Construction and evaluation of Phase I of the prototype course:

FY 69			
1	2	3	4
*CA	A	D	DS

- III. Construction of Phase II of the prototype course, and evaluation of the entire course:

FY 69				FY 70			
1	2	3	4	1	2	3	4
P	CA	CA	CA	CA	AD	D	DS

WORK UNIT STATEMENT

1. Development of a Manual for Community Service Volunteers—COMSERVE (Continuing)
2. Location: HumRRO Division No. 7 (Language and Area Training)
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research. To develop a manual to assist in the recruitment, training, and utilization of volunteers in the Army Community Service Program.
 - b. Potential Military Research End-Result. The manual will provide uniform and sustained guidance to Army Community Service staff and volunteers.
 - c. Background and Summary. Army Community Service (ACS) is dedicated to assisting members of the Army community in meeting personal and family problems which are beyond their own resources. While general guidelines have enabled the program to operate successfully, a manual is needed to provide more specific guidance for staff members responsible for the operation of ACS programs and for nonprofessional personnel who serve on ACS boards. A subcontract for the study was signed with the University of Maryland (School of Social Work) in January 1968. The subcontractor's planning has been completed and visits to ACS centers have begun.
 - d. FY 69 Projection. Visits to ACS centers will continue. The first drafts of the manual will be completed and submitted to selected ACS personnel and appropriate personnel in DCSPER for comment. A final draft will then be prepared.
5. Estimated Professional Man-Years Required:

FY 69: 0.0

This Work Unit has been subcontracted; minimal time investment is anticipated for HumRRO monitoring.
6. Interested Agencies:

U S. Continental Army Command
Volunteers in Service to America (VISTA)
7. Work Sub-Unit Summary and Forecast:
 1. Development of an ACS manual:

FY 69			
1	2	3	4
*C	A	D	DS

WORK UNIT STATEMENT

1. A Program of Instruction for the Development of Cultural Self-Awareness—COPE (Continuing)
2. Location: HumRRO Division No. 7 (Language and Area Training)
3. Sponsor: Deputy Chief of Staff for Military Operations,
Department of the Army
4. Scope:
 - a. Objective of Research. To design, produce, and evaluate a program of audio-visual instruction for the development of cultural self-awareness.
 - b. Potential Military Research End-Result. The inclusion of this program in stateside area training programs or in mission orientation programs overseas should increase the potential effectiveness of mission officers.
 - c. Background and Summary. Officers serving in U.S. military missions overseas play a variety of roles (advisors, consultants, helpers, change agents, trainers, monitors) requiring effective communication with host-country officers. In Latin America, Asia, and Africa, communication is difficult to achieve because many of the cultural characteristics of Americans are not shared by host-country personnel. It is assumed that effective intercultural communication requires cultural self-awareness (i.e., one's awareness of how thought processes and actions are influenced by one's own cultural background). However, most people are generally aware of only the more obvious influences of culture, such as those reflected in habits and customs regarding dress, food, shelter, or religion.

The instructional program to be developed in this Work Unit is intended to bring about a more comprehensive cultural self-awareness by focusing on certain pervasive influences of culture of which people are generally unaware. The program is to consist primarily of sequences of filmed (or video taped) scenes and/or excerpts of scenes showing Americans in interaction with foreign nationals. COPE I deals with the design and production of the program, COPE II with its evaluation. During FY 1968, various methods of producing the scenes were explored.
 - d. FY 69 Projection. The program plan will be developed in COPE I and a trial instructional unit of film (or TV tape) and printed material will be produced. In COPE II, the method of evaluating the instructional program will be developed, which may include criterion situations that test the trainee's ability to recognize the influence of cultural factors on his own thinking and behavior, and a technique for measuring the trainee's ability to recognize pertinent cultural influences in the criterion situations.
5. Estimated Professional Man-Years Required:

FY 69: 2.5
FY 70: 4.0

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6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel,
 Department of the Army
 U.S. Continental Army Command
 Military Assistance Institute
 Foreign Service Institute
 Center for Research in Social Systems
 Agency for International Development
 Peace Corps
 Defense Language Institute

7. Work Sub-Unit Summary and Forecast:

I. Design and production of the instructional program:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*CA	PCA	PCA	CA	CA	CA	AD	AD

II. Evaluation of the instructional program:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PC	PCA	PCA	CA	CA	CA	AD	AD

WORK UNIT STATEMENT

1. Feasibility Study of a System for Debriefing MAAG Advisors—DEBRIEF (Continuing)
2. Locations: Overseas locations (to be determined)
HumRRO Division No. 7, (Language and Area Training)
3. Sponsors: Advanced Research Projects Agency, Department of Defense
Chief of Research and Development, Department of the Army
4. Scope:
 - a. Objective of Research. To develop and evaluate techniques, instruments, and systematic procedures for debriefing U.S. military personnel who have served overseas with the Military Assistance Program, in order to (1) obtain information relevant to improving standards and methods of advisor training, and (2) develop and evaluate procedures for processing, packaging, and disseminating the information obtained.
 - b. Potential Military Research End-1 It. Advisor debriefing programs in a small sample of two to four strategically important countries will be developed and implemented. These programs will (1) systematically collect and evaluate information from U.S. military advisors concerning their problems, attitudes, perceptions, and interactions with counterparts, and (2) respond to research interests in the areas of advisor utilization, training, and in-country orientation. Considered collectively, the programs will provide a basis for considering whether a wide-ranging, generally standardized advisor debriefing system is feasible, and how it might contribute to Army-wide advisor assignment and utilization, training, program planning and management, and related doctrine.
 - c. Background and Summary. Initial development of the advisor debriefing concept included a literature survey; a survey of existing procedures for advisor debriefing, identification of U.S. military, other government, and nongovernment organizations or agencies having interest in the subject; and the provision to U.S. Army Forces Southern Command of Technical Advisory Service on debriefing procedures.

By the end of FY 1967, an Advisor Debriefing Program was established in the U.S. Military Assistance Command, Thailand (USMACTHAI). That program (now Work Unit REFOCUS) remains fully operative and provides a continuing flow of data relevant to DEBRIEF. Throughout FY 1968 the DEBRIEF research effort was concentrated on work with Work Unit REFOCUS in the systematic continuation, extension, and modification of the debriefing program in USMACTHAI, and on the preparation of plans for introducing advisor debriefing programs in one additional country. Further analysis of Thailand data continued, and REFOCUS experience was examined for applicability to the broader purposes of DEBRIEF.
 - d. FY 69 Projection. As data collection and analysis for the Advisor Debriefing Program, USMACTHAI, continues under Work Unit REFOCUS, potential input for DEBRIEF I and II will be examined and extracted. A

DEBRIEF

new edition of the collection instrument for use in a second country will be prepared if experience indicates the need for it. Introduction of advisor debriefing programs in one or more additional countries will be planned. If funds and other considerations permit, a HumRRO team will survey local conditions and introduce an Advisor Debriefing Program in a second Military Assistance Advisory Group (MAAG). Data collection in the second MAAG will commence.

5. Estimated Professional Man-Years Required:

FY 69: 1.0

FY 70: 2.0

6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel, Department of the Army
U.S. Military Assistance Command, Thailand
U.S. Continental Army Command
U.S. Army Combat Developments Command
Directorate of International and Civil Affairs, Office of the Deputy Chief
of Staff for Military Operations, Department of the Army
U.S. Army Behavioral Science Research Laboratory
Military Assistance Institute
Center for Research in Social Systems

7. Work Sub-Unit Summary and Forecast:

I. Debriefing studies within selected commands:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*AP	P	C	C	CAD	CAD	CA	CA

II. Feasibility of a debriefing system: To be determined.

WORK UNIT STATEMENT

1. Implementation and Modification of the USMACTHAI Advisor Debriefing Program—REFOCUS (Continuing)
2. Locations: Bangkok, Thailand
HumRRO Division No. 7 (Language and Area Training)
3. Sponsors: Advanced Research Projects Agency, Department of Defense
Chief of Research and Development, Department of the Army
4. Scope:
 - a. Objective of Research. To develop and evaluate techniques and instruments for the systematic continuation and modification of the Advisor Debriefing Program within U.S. Military Assistance Command, Thailand (USMACTHAI). Specific purposes are to (1) focus the debriefing research effort upon the local situation, (2) provide for timely revision of data collection instruments in order to reflect changes in the local situation, (3) insure continuity in data collection, and (4) assist USMACTHAI in interpreting, evaluating, and utilizing the information provided by this and related research efforts.
 - b. Potential Military Research End-Result. Under this Work Unit an advisor debriefing program is being maintained and improved in Thailand. This program (1) provides systematic collection and evaluation of information from U.S. military advisors concerning their problems, attitudes, perceptions, and interactions with counterparts, and (2) remains responsive to command and research interests in the areas of advisor utilization, training, and in-country orientation. The research contributes to broader studies of single and multi-country debriefing systems.
 - c. Background and Summary. Preliminary steps in the development of the advisor debriefing concept were undertaken by HumRRO in Exploratory Study 48. By June 1967 a HumRRO research team in Thailand had established an Advisor Debriefing Program for USMACTHAI. Throughout FY 1968, this program was continued, extended, and modified in Work Unit REFOCUS. Data collection and analysis continued under the supervision of the HumRRO representative. The collection instrument was refined through the introduction of a Thai Annex. Frequency tabulations of base data (150 respondents) and selected comments from respondents were provided to the Comprehensive Army Survey Thailand (CAST) Study Group, to the Advanced Research Projects Agency Research and Development Field Unit Thailand (ARPA/RDFU-T), and to USMACTHAI, as were complete files of all comments and responses. A draft narrative report on the program was prepared for USMACTHAI.
 - d. FY 69 Projection. The Thai Annex to the collection instrument will be evaluated and modified. Data collection will continue on a quarterly schedule, and interpretive service provided USMACTHAI as requested. Applicable REFOCUS results will become input for Work Unit DEBRIEF.

REFOCUS

Decision will be sought concerning continuation of the debriefing program in USMACTHAI, and possible HUMRRO participation therein, beyond the end of FY 1969. Analysis of data will continue, and a second narrative report, based on a larger body of data than that of FY 1968, will be prepared for the sponsor and USMACTHAI.

5. Estimated Professional Man-Years Required:

FY 69: 0.5

FY 70: 0.5

6. Interested Agencies:

U.S. Military Assistance Command, Thailand

U.S. Continental Army Command

U.S. Army Combat Developments Command

Directorate of International and Civil Affairs, Office of the Deputy Chief of Staff for Military Operations, Department of the Army

U.S. Army Behavioral Science Research Laboratory

Military Assistance Institute

Center for Research in Social Systems

7. Work Sub-Unit Summary and Forecast:

I. Continuation and refinement of USMACTHAI debriefing system:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*CAD	CA	CA	CAD	AD	AD	D	DS

WORK UNIT STATEMENT

1. Factors Influencing Effectiveness of Advisor-Counterpart Interactions—REFRACT (New)
2. Locations: HumRRO Division No. 7 (Language and Area Training)
Republic of Korea
3. Sponsor: Deputy Chief of Staff for Military Operations,
Department of the Army
4. Scope:
 - a. Objectives of Research. To define and develop operational techniques for assessing the effectiveness of advisor-counterpart interactions, and to identify factors that influence them.
 - b. Potential Military Research End-Result. The products of this research will provide a comprehensive description of the interpersonal, situational, and organizational factors that are empirically related to the effectiveness with which advisors interact with counterparts in foreign military organizations. Knowledge of these factors can be expected to assist military planning, policy-making staffs, as well as those who have responsibility for the training and management of Military Assistance Program (MAP) advisors, in making decisions on implementing the Program. The research will provide these personnel with a basis for evaluating alternate courses of action, and estimating their probable consequences upon interaction effectiveness.
 - c. Background. Fulfillment of the Army's responsibilities in the Military Assistance Program necessitates the annual assignment of significant numbers of Americans to work with members of foreign military organizations over extended periods of time, and sometimes under difficult circumstances. The missions, methods, and conditions characteristic of these assignments are often very different from those normally encountered during a military career. Regulations specifying qualifications required for advisory assignments, and the establishment of special training programs designed to prepare prospective personnel for such duties, indicate official military recognition of these difficulties.

The successful management and implementation of these programs depends upon knowing, accurately and in detail, what constitutes effectiveness in advisor-counterpart interaction and what factors can be controlled to increase it. The attainment of long-term MAP objectives depends upon knowing how effectively advisors currently interact with counterparts.

Previously collected information concerning the activities, problems, attitudes, and perceptions of military advisors formerly assigned in the Republic of China, Iran, and Thailand has been used to identify essential elements of the advisor-counterpart relationship. In MAP II, study was made of on-going interactions between members of the Korean

REFRACT

Military Assistance Advisory Group (MAAG) and Korean Army counterparts. This study has produced an approach to the criterion problem and several data collection instruments needed to estimate the validity of the criterion assessments. The criterion of effectiveness developed in Work Unit MAP is directed at the willingness of advisors and counterparts to continue working together. Analyses of these data obtained in the Republic of Korea demonstrated a number of important relationships between (1) the criterion scores given by one co-worker to the other and the characteristics of the individuals who gave them, and (2) the characteristics of the co-worker receiving the criterion scores and the nature of the interactions that had occurred. Identification of the factors that may account for lack of reciprocations (the choice of one-half of the pairs of advisors and counterparts) requires further study.

- d. Method of Attack. REFRACT I will consist of two phases. The first consists of a pilot study to identify advisor-counterpart pairs with which to form four contrast groups, to be classified on the basis of (1) willingness to continue working together, (2) lack of willingness to continue working together, (3) reciprocated willingness or unwillingness, and (4) unreciprocated willingness or unwillingness. Following identification of the contrast groups, their members will be interviewed to obtain information bearing upon factors that appear related to the observed differences.

In the second phase, the factors identified in the first phase will provide a basis for the development of objective data collection techniques appropriate for collecting similar information from larger groups of advisors and counterparts. The latter contrast groups will be compared in order to explicate further the nature of those conditions presumed to affect reciprocated willingness to continue working together.

REFRACT II will be directed toward evaluation of the extent to which the conclusions thus far reached may have applicability beyond the particular country, culture, and circumstances from which they were drawn. For this purpose, it is planned to replicate the study in one or more MAAGs in different areas of the world.

5. Estimated Professional Man-Years Required:

FY 69: 1.5
FY 70: 3.0

6. Interested Agencies:

Office of the Assistant Secretary of Defense (International Security Affairs)
Office of the Deputy Chief of Staff for Personnel,
Department of the Army
Office of the Surgeon General, Department of the Army
U.S. Continental Army Command
U.S. Army Combat Developments Command
U.S. Army Behavioral Science Research Laboratory

Military Assistance Institute
 Korean Military Advisory Group
 Center for Research in Social Systems

7. Work Sub-Unit Summary and Forecast:

I. Identification of criterion factors:

FY 69				FY 70			
1	2	3	4	1	2	3	4
P	PC	CA	CA	CA	CA	D	DS

II. Cross-cultural validation of criterion: To be determined.

WORK UNIT STATEMENT

1. Overseas Military Posts and Communities—SOJOURN (Continuing)
2. Location: HumRRO Division No. 7 (Language and Area Training)
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research. To develop and illustrate the application of methods for obtaining information relevant to the management, organization, and planning of overseas American military communities.
 - b. Potential Military Research End-Result. The methods of data collection and analysis produced by SOJOURN would provide local commanders overseas with a systematic means of gathering and interpreting information germane to their role as managers of military communities, and would supply information to military agencies responsible for overseas American military communities. The quantitative and qualitative data from prototype community studies should be of immediate value to commanders in the localities selected.
 - c. Background and Summary. The overseas assignment of military personnel who are accompanied by dependents has resulted in the development of American military communities in overseas settings. Systematic study of the characteristics of such communities and the ways in which these characteristics influence morale and mission accomplishment is needed as a basis for reaching decisions affecting conditions in existing communities or planning of emergent communities.

Methods for collecting information about the characteristics of overseas military communities are being developed and are to be applied in the study of several overseas communities to determine the feasibility of the methods and the utility of the information they yield, and to provide data bearing upon selected hypotheses (e.g., on relationships between internal community characteristics and the interactions community members have with members of the host society). As the basic building block in the communities to be studied, the military family will receive special attention.

Through literature surveys and interviews with persons knowledgeable about conditions in overseas American communities, a number of potentially relevant characteristics have been identified and defined in SOJOURN I. These characteristics include the spatial arrangement of residences and work places; the age, sex, and marital status of community members; the number and kinds of recreational, shopping, health, or educational facilities available; the amount and kinds of social activities in which community members engage with one another and with host nationals; and attitudes regarding existing arrangements for meeting the basic needs of community members as well as satisfaction with life in the community generally. Major sources of data have been identified and a working set of methods, techniques, and instruments adapted or devised. A questionnaire

SOJOURN

was constructed for the preliminary study of a continental U.S. (CONUS) military community. Liaison was established through the Army Community Services Center in this community, a field staff assembled, and data collection begun.

- d. FY 69 Projection. Under SOJOURN I, field work in a military community in CONUS will be completed and the resultant data will be analyzed, interpreted, and reported. Under SOJOURN II, the necessary planning documents will be prepared, and the methods and techniques developed for studying the CONUS community will be revised and used in a survey of an overseas American military community.

5. Estimated Professional Man-Years Required:

FY 69: 2.0

FY 70: 3.0

6. Interested Agencies:

U.S. Continental Army Command

U.S. Army Combat Developments Command

Office of Personnel Operations, Department of the Army

Directorate of International and Civil Affairs, Deputy Chief of Staff for Military Operations, Department of the Army

Center for Research in Social Systems

7. Work Sub-Unit Summary and Forecast:

I. Development of survey instruments and techniques:

FY 69			
1	2	3	4
*CA	AD	D	DS

II. Field studies of overseas communities:

FY 69				FY 70			
1	2	3	4	1	2	3	4
	P	CA	CA	AD	CAD	AD	DS

EXPLORATORY RESEARCH STUDY

1. Title: U.S.-Thai Security Guard—ES-73 (New)
2. Location: HumRRO Division No. 7 (Language and Area Training)
3. Sponsor: Advanced Projects Research Agency, Research and Development Field Unit, Thailand
4. Scope:
 - a. Objective of Research. To assess the extent to which cultural factors affect the performance of personnel involved in the Thai Security Guard Program.
 - b. Military Problem. The Thai Security Guard (TSG) Program was created to provide armed security forces for the protection of U.S. resources in Thailand. The Guard consists of a bi-national paramilitary force, under Thai command and U.S. operational control. A previous HumRRO study concerned with the Korean Augmentation to the U.S. Army (ES-40) indicated that the problems associated with managing bi-national military units strongly reflect some of the differences that are inherent in the broader cultures from which the participants are drawn. Effective control and resolution of these differences places unusual demands upon local U.S. commanders.

This Study is based upon a request from the Military Research and Development Center, Supreme Command Headquarters, Ministry of Defense, Thailand to the Advanced Research Projects Agency, Research and Development Field Unit, Thailand (ARPA/RDFU-T) to undertake studies of the defense of airbases in Thailand.
 - c. Approach. Reports and records relating to the TSG will be studied and interviews will be conducted with American and Thai personnel who are participants in the program in order to (1) analyze the roles and working relationships of Thai and U.S. personnel having responsibilities in the Program, and (2) identify directions of research which could contribute to the effectiveness with which U.S. and Thai personnel perform the security function.

5. Estimated Professional Man-Years Required:

FY 69: 0.5

6. Interested Agencies:

U.S. Military Assistance Command, Thailand
U.S. Army Combat Developments Command
U.S. Continental Army Command
Directorate of International and Civil Affairs, Office of the Deputy Chief
of Staff for Military Operations, Department of the Army
Office of the Provost Marshall General, Department of the Army
U.S. Army Behavioral Science Research Laboratory
Military Assistance Institute
Center for Research in Social Systems

Research Area 5:
TRAINING TECHNOLOGY

Research Area 5:

Training Technology

Title:

Work Units

Instructional Model/Prototypes Attainable in Computerized Training (IMPACT)
Small-Group Instructional Methods (INGROUP)
Proficiency Measurement Techniques (JOBTEST)

Basic Research Studies

Common Job Elements (BR-8)
Prompting and Guidance (BR-14)
Behavior Management (BR-18)
Definition of Learning Variables (BR-19)

Description:

Many HumRRO research activities make contributions, direct or indirect, to the development of a technology of training, but in this Research Area the Work Units and other research efforts are specifically concerned with the subject of technology. Their objective is to develop general methods for training individuals and groups and for maintaining desired performance, methods that would be applicable for a wide range of subject matter and training circumstances. The research deals with both instructor-administered and instructor-free training, and there is special interest in techniques—such as simulation, miniaturization, and automated instruction—that might lead to more efficient training, in terms of both time and money. There is also interest in ways of improving training effectiveness through improved motivation. The research includes not only the development of techniques suitable for immediate implementation, but also more basic explorations into the learning processes that might lead to marked improvements in future training efforts.

Level of Effort in FY 1969: 23.0 BMYS.

WORK UNIT STATEMENT

1. Instructional Model/Prototypes Attainable in Computerized Training—
IMPACT (Continuing)
2. Location: HumRRO Division No. 1 (System Operations)
3. Sponsor: Chief of Research and Development, Department of the Army
4. Scope:
 - a. Objective of Research. To develop (1) a prototype computer-administered instructional system with (2) accompanying prototype multiple-track (branching), individualized programs of instruction. To be selected for prototype development, each course must be (1) critical for the Army, and (2) representative of a particular kind of behavior.
 - b. Potential Military Research End-Result. Work will be directed toward developing a mature, effective computer-administered instruction (CAI) system through a coordinated evolution of the various facets—decision model, hardware, and software. In the process, prototypes of instructional programs in task areas critical to the Army will be prepared. Development is planned over five years, through at least two generations of CAI systems, in order to give the Army an operationally useful (although still quite limited) system as early as possible, and also to benefit from experience with wide operational evaluation. Ultimately, the proposed advanced development effort will provide the Army with its own capability for developing sound, effective CAI materials. The programs will be designed and documented for use by instructors, lesson designers, or subject matter experts, so that they will be able to modify the course for their own purposes.
 - c. Background. Great advances may be possible, both in learning and in the management of training, through use of computer-administered instruction. In CAI, complete control can be exercised over the presentation of materials and the responses by trainees. The essence of CAI is the instructional decision model—a set of rules for matching presentation of specific content (selecting and sequencing) with trainee capabilities (student characteristics and responses to earlier material). While the computer is merely the implement for gaining a range and precision of control over the learning environment that cannot be attained by any other instructional agent, the capabilities of the computer's hardware and software do constrain the decision model.

An integrated, interdisciplinary approach is being used in four phased development cycles, each of which will produce a number of useful products. In IMPACT I, "raw" hardware, software, job-relevant instructional content information, student capability information, and an a priori

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decision model are being integrated into a provisional CAI system with an attendant prototype course. COBOL computer programming was chosen for the course content because of (1) subject matter expertise gained in HumRRO development of a programmed instruction course in computer programming fundamentals under Work Unit METHOD, and (2) the recognized need for greater informed use of computers within the Army and Department of Defense. This initial formulation is to be completed in FY 1969.

In IMPACT II, the "breadboard" model will be tested for effectiveness and revised into a first-generation prototype of a CAI system that will be operationally implementable. In IMPACT III, a second-generation CAI system will be designed, incorporating improvements in hardware and software, and especially in the model of the instructional decision process. A wider variety of training content will be selected, resulting in other useful prototype CAI courses. During IMPACT IV, system-effectiveness tests for the second-generation system will be used to begin assessing long-range effects of CAI. Simultaneously, a third-generation CAI system of upgraded and expanded capability will be designed, continuing to focus on unique and critical job-task situations and field applications.

During FY 1968, IMPACT I developmental activities on the various facets of a CAI system have included the following:

Hardware—The first of 12 student terminals, consisting of a cathode-ray tube (CRT) and typewriter keyboard, along with related equipment such as communication buffers and control units, have been received from the manufacturers. Arrangements have been made to obtain 12 Perceptoscopes, and a Sylvania Electronic Tablet. Design and construction of the student cubicles has begun.

Software—The METHOD computer programming material has been converted for use with the IBM 360 computer. The IBM360 Coursewriter Source Tape is being converted for use with the student terminals. A survey has been made of all available CAI languages, with reference to making plans for the formulation of the final language to be used in IMPACT.

Instructional Content—Instructional programmers were trained in the COBOL language, and the initial COBOL course was developed. A survey was completed of about 20 Army installations to determine the elements of the COBOL programmer's job and the characteristics of the personnel in these jobs.

Instructional Decision Model—Following a literature survey and exploratory seminars, concepts of the model were formulated and work was begun to modify the Coursewriter to fit the initial model for the breadboard prototype. Work was begun on describing the structure of the subject matter, and the applicability of dynamic programming to the model is being explored.

- d. FY 69 Projection. Work on the provisional CAI system in IMPACT I will continue; the work will phase into the system development that will prepare for IMPACT II work on the first-generation CAI prototype. Activities on the various facets of the system in IMPACT I will include the following:

Hardware—It is expected that the student terminals (CRT plus auxiliaries) will be completed and that the remainder of the Sanders CRTs will be received and put into operation. Computer memory capacity and disk storage capacity will be upgraded, with increased access speed. The Perceptoscopes and the Sylvania Tablet are expected to be operational.

Software—Conversion of the Coursewriter to function with the CRT will be completed, and a function list added to increase available capability. Concepts and design specifications for the second-generation system will be completed. The language analysis will be completed and the language to be used in IMPACT will be conceptualized.

Instructional Content—The COBOL course will be expanded, tested, and completed. Other subjects to be used in CAI under IMPACT III will be explored.

Instructional Decision Model—The preliminary model for use in the final phase of IMPACT I work will be designed, programmed, and installed. After extensive testing, the model will be revised.

5. Estimated Professional Man-Years Required:

FY 69: 17.0
FY 70: 20.0

6. Interested Agencies:

Office of the Assistant Chief of Staff for Force Development,
Department of the Army
Office of the Deputy Chief of Staff for Personnel,
Department of the Army
U.S. Army Materiel Command
U.S. Continental Army Command
U.S. Army Security Agency
U.S. Army Adjutant General School
Personnel and Training Research Division, Office of Naval Research
Behavioral Sciences Laboratory, Air Force Aerospace Medical Division
Defense Weapons Systems Management Center
Technology Directorate, Systems Development Corporation
Institute for Mathematical Studies in the Social Sciences,
Stanford University
Coordinated Science Laboratory, University of Illinois
Center for Research on Learning and Teaching, University of Michigan
College of Education, Pennsylvania State University
Computer Center, Graduate Division, University of California at Irvine

7. Work Sub-Unit Summary and Forecast:

I. Development of the provisional CAI system and prototype course (Cycle I):

	FY 69				FY 70			
	1	2	3	4	1	2	3	4
Hardware	*X	X	X	X				
Software	*X	X	X	X	X	X	X	X
Instructional Content	*X	X	X	X	X	X	X	X
Decision Model	*X	X	X	X	X	X		

II. Evaluation of the first-generation operational CAI system (Cycle II):

	FY 69				FY 70			
	1	2	3	4	1	2	3	4
Hardware								X
Software						X	X	X
Instructional Content								X
Decision Model								

III. Development of the second-generation CAI system and additional prototype courses (Cycle III):

FY 71-73

IV. Evaluation of the second-generation CAI system, and design of the third-generation system (Cycle IV):

FY 72-74

WORK UNIT STATEMENT

1. Small-Group Instructional Methods—INGROUP (New)
2. Location: HumRRO Division No. 4 (Infantry)
3. Sponsor: U.S. Continental Army Command
4. Scope:
 - a. Objectives of Research. To evaluate the effectiveness of small-group instructional techniques, and to identify ways to best exploit these techniques for military instruction.
 - b. Potential Military Research End-Result. As a result of this research, specific information will be available concerning the use of small-group methods within a military instructional context. This information will be in terms of advantages, disadvantages, potential uses, procedures for implementation, requirements for instructors, and relative effectiveness of small-group techniques in comparison with other teaching methods.
 - c. Background. The U.S. Army Infantry School has requested HumRRO to begin research to develop information on ways small-group techniques may be used to improve the effectiveness of applicable instruction.
 - d. Method of Attack. A survey of the literature and an analysis of the current "state of the art" will be completed, and the information obtained will be used to develop a handbook of small-group instructional techniques. Materials will then be developed to prepare potential instructors to use small-group methods. Finally, small-group techniques will be compared with other teaching methods in an experiment.
5. Estimated Professional Man-Years Required:

FY 69: 0.5
FY 70: 0.5
6. Interested Agencies:

Office of the Deputy Chief of Staff for Personnel, Department of the Army
U.S. Army Infantry School
U.S. Army Armor School
U.S. Army Command and General Staff College
U.S. Army War College
U.S. Army Management School
Industrial College of the Armed Forces
7. Work Sub-Unit Summary and Forecast:

I. Research on small-group instructional methods:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PC	CAD	AD	D	CA	CA	D	D

WORK UNIT STATEMENT

1. Title: Proficiency Measurement Techniques--JOBTEST (New)
2. Location: HumRRO Division No. 2 (Armor)
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objectives of Research. To investigate and evaluate a variety of concepts and procedures for measuring job performance, in order to identify techniques that are valid and useful in practical testing environments and that have generality across groups of tasks.
 - b. Potential Military Research End-Result. The research program will give the Army reliable, valid, and efficient methods by which to measure the proficiency of enlisted men in various types of tasks. More effective evaluation information will give the Army a more accurate assessment of readiness and of needs for remedial training, and a sounder and more equitable basis for awarding military occupational specialties (MOSs) and proficiency pay.
 - c. Background. A primary reason that the Army uses proficiency tests is to support the implementation of certain portions of the Enlisted Personnel Management System. The Management System was devised to implement certain portions of the mission of Deputy Chief of Staff for Personnel, Department of the Army, specifically its responsibility for "planning, programming, coordinating, formulating policy, and supervising the execution of personnel management; promotion, general educational development" (Army Regulation 10, para. 24b).

The survey by the Board of Inquiry on the Army Logistics System (Brown Board) and other surveys of maintenance activities have raised questions about the validity of the proficiency measures and performance standards employed in awarding MOSs and proficiency pay. It is likely that the method of proficiency measurement most commonly employed (paper-and-pencil examination) limits the validity of proficiency assessment that may be achieved in evaluating certain types of tasks.
 - d. Method of Attack. JOBTEST I will be concerned with the development of reliable procedures for assessing on-job performance, since performance on the job must serve as the criterion for the validation of other assessment techniques. The job of general vehicle mechanic was selected for the research, as considerable information was available from an earlier research program.

JOBTEST II will be concerned with the research and development of a range of proficiency measurement possibilities, from purely subjective ratings to on-the-job behavioral measures, in both real and simulated environments. These possibilities will be investigated and compared with the work sample standard (as developed in JOBTEST I) for reliability, validity, ease of manufacture, application and cost.

JOBTEST

5. Estimated Professional Man-Years Required:

FY 69: 1.0

FY 70: To be determined.

6. Interested Agencies:

Office of the Deputy Chief of Staff for Logistics, Department of the Army

Office of Personnel Operations, Department of the Army

U.S. Continental Army Command

U.S. Army, Europe

7. Work Sub-Unit Summary and Forecast:

I. Development of a work sample test for the general vehicle mechanic:

FY 69				FY 70			
1	2	3	4	1	2	3	4
P	C	C	A	AD	D	DS	

II. Development and evaluation of correlated measures of job performance using simulated and nonsimulated environments:

FY 69				FY 70			
1	2	3	4	1	2	3	4
			P	P	PC	CA	A

BASIC RESEARCH STUDY

1. Title: Common Job Elements—BR-8 (Continuing)
2. Location: HumRRO Division No. 2 (Armor)
3. Estimated Professional Man-Years Required:
FY 69: 0.5
4. The objective of the research is to provide a classification system for relating training methods to the types of job requirements with which they are most effective.

For the Army, such a classification system could permit (1) a precise identification of the job changes imposed by new systems and of the amount of change that will be necessary in on-going training programs, (2) a basis for choosing the optimal procedure to be used in training for a particular task skill or knowledge, (3) a foundation for specifying the standards of human performance, and (4) a system for extrapolating training knowledge and research between a number of "different" tasks.

Work has been divided into three continuous, overlapping activities: development of a conceptual and methodological approach, an Army job task classification and analysis, and a determination of psychological dimensions underlying job requirements and training methods. Within the conceptual activity, an original literature survey indicated a number of system and task dimensions that might provide operational definitions of distinguishing categories.

However, preliminary attempts to utilize available systems to specify categories and dimensions indicated that an underlying system was necessary in order to distinguish dimensions and functionally relate job task and training method. Accordingly, it was decided to specify tasks in terms of the characteristics of the stimulus input, trainee, and response output as defined by some underlying system. Two methodological papers were prepared detailing the gross structure of task performance in terms of a stimulus-trainee learning model and a trainee-response classroom strategy model. A study integrating the dimensions of the two structures was completed, but work on classifying and further analyzing Army job tasks was suspended pending the development of an acceptable sample of job task descriptions in Work Unit MBT. The definition of psychological dimensions was attempted through laboratory studies within the S-O-R paradigm. Also, a number of studies of the physical and verbal stimulus correlates of tasks and training methods have been completed. The nature of this work is being reviewed to judge its applicability to the classification problem.

Future work will continue to be directed toward the above activities. Approach and methodology will be further defined and augmented as necessary and possible, and coordinated with similar projects being initiated by other agencies. Classification and further analysis of the results of task analyses of Army jobs will be begun with the data from Work Unit MBT. Laboratory studies of selected relationships between stimulus-trainee characteristics and task-training categories resulting from the above two activities will be continued.

BASIC RESEARCH STUDY

1. Title: Prompting and Guidance—BR-14 (Continuing)
2. Location: HUMPRO Division No. 2 (Armor)
3. Estimated Professional Man-Years Required:
FY 69: 1.0
4. The objective of the research is to develop effective methods for training men to perform simple, everyday, Army tasks, such as procedures or reference information, by applying prompting and guidance techniques in experimental training programs. A "prompting" or "guidance" technique is defined as a method of training that puts the learner in a realistic work situation and indicates each required action, one step at a time, as he performs the task.

For most soldiers, daily tasks require only simple responses or knowledge. Instruction in such simple performances forms the bulk of most military training courses, and constitutes most of the training problems. The research plan is to develop general methods for teaching such performances reliably, in the time, and with the facilities available. The research findings will be organized into procedural manuals on student performance guidance for use by technical writers and by those who administer training.

After extensive development, experimental programs are being conducted with three representative tasks: disassembly/assembly of the M73 machine gun, representing procedural learning, task identification, representing information training, and standard form or record completion, representing both. Several major issues are being studied: audio-visual vs. visual guidance, step-by-step vs. total-task presentation, the importance of empirical development of guidance, the optimal degree of prompting, the effect of inhibiting guessing, and the effect of highlighting distinctive features.

BASIC RESEARCH STUDY

1. Title: Behavior Management—BR-18 (Continuing)
2. Location: HumRRO Division No. 2 (Armor)
3. Estimated Professional Man-Years Required:
FY 69: 1.0

4. The objective of the research is to study the management of behavior by immediate reinforcement of successful performance, which has proven to be a powerful method of motivating students to do well in training.

Reinforcement typically consists of permission to engage in a desired behavior upon completion of a required step in training. In response to the existing need to determine the suitability of contingency reinforcement techniques for military training, HumRRO conducted a reinforcement study using students engaged in self-paced programmed instruction. By rapidly completing the program, the student could earn the privilege of engaging in a prized activity selected from a list of desirable alternatives.

The results of the first study indicated the value of such a contingency reinforcement model in military training. Additional study will be carried out to refine the ongoing program to render it applicable and effective in a wide range of training situations.

BASIC RESEARCH STUDY

1. Title: Definition of Learning Variables—BR-19 (Continuing)
2. Location: HumRRO Division No. 4 (Infantry)
3. Estimated Professional Man-Years Required:
FY 69: 2.0
4. The objective of the research is to conduct studies to determine the effect of learning variables in complex learning situations.

An ongoing Army training program will be used as the research medium. Instruction for a given block of hours will be recorded on videotape. Questionnaires and other correlative data will be compared with test performance. The instructional materials, tests, questionnaires, and other correlative data will be manipulated to optimize test performance and later field applications.

In the process of optimizing the instructional package, certain variables should develop prominent effects. These variables will be defined and their effects plotted for the given course material. Eventually, after several different types of course material have been used, the relevance of these variables to different types of materials will be determined. In all cases, the goal of the research will be the identification of primary learning variables, and the predictive quantification of their effects.

Research Area 6:
TRAINING MANAGEMENT

Research Area 6:
Training Management

Title:

Work Units

Analysis of the Army Training Center System (ATCSYSTEM)
Correlational Analysis of Aviator Performance (PREDICT)
Development of Training Management Procedures for Heterogeneous
Ability Groups (STOCK)

Unfunded

Civilian Work Force (ES-)

Description:

Research in this area goes beyond improvements in training content and instructional methods. Studies include analysis of the Army training organization and its place in the Army structure, as well as studies relating to administrative and organizational problems within the training system. The Research Area includes studies directed toward necessary modification of training administrative procedures and organizational structure to allow effective introduction of improved instructional procedures.

Level of Effort in FY 1969: 8.5 BMys.

WORK UNIT STATEMENT

1. Analysis of the Army Training Center System—ATCSYSTEM (New)
2. Location: HumRRO Division No. 3 (Recruit Training)
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research: To improve the efficiency with which the Army Training Center (ATC) system attains its objectives.
 - b. Potential Military Research End-Result:
 - (1) A regularly updated description or model of the ATC system will be developed, showing how its components jointly contribute to attainment of objectives and making explicit the premises and preconditions for continued effective contribution.
 - (2) There will be an ongoing program of identification of problem areas, if they exist, where components are projected to undercontribute, be redundant, or work at cross-purposes, given particular projection premises.
 - (3) A continuing series of identifications of possibilities for increased ATC efficiency will be provided.
 - (4) Projections of ATC system functioning under various conditions will be made.
 - c. Background and Summary. Since 1951, HumRRO has provided the Army with the results of a series of studies of various aspects of training methods, motivation, and morale. These have included new training methods programs for teaching combat rifle firing in basic training, and for training armor crewmen, as well as a series of improvements in training for combat support. With the continued success of these HumRRO programs dealing with individual components, future research needs will probably increasingly involve relations among components. Consequently, an Exploratory Study of the Army Training Center System, ES-69, was initiated in July 1967.

Initial results of ES-69 included confirmation that it is feasible to examine the interrelationships among the various components, and that this can be accomplished by integrating field observations at ATCs with information provided by agencies of DCSPER and CONARC. It was concluded that the quality of the product of the ATC system is at an all-time high, but there are problems involving interactions among components that tend to increase the need to expend effort in turning out the ATC product. Because these problems are broader than the scope of earlier HumRRO work, they were not pinpointed by HumRRO until 1967, at which time the ES-69 progress report listed some 40 such problem areas.

Work Unit ATCSYSTEM is intended to supplement HumRRO's continuing contributions to specific Army components with overall analysis of the ATC system. The ATC system's objectives and methods for attaining them will be studied to provide a regularly updated projection of what can be expected in the future. The approach to be used will make possible advance planning to prevent problems, and will facilitate remedial planning, by enabling it to be done from the broad view of relations among the components of the entire ATC system, rather than being limited to a particular component.

- d. Method of Attack. The present program of the ATCs will be analyzed with respect to such aspects as training objectives; curriculum; subject schedules; requirements for, demands on, and availability of instructors, equipment, and facilities; prerequisite abilities, aptitudes, and availability of students. DCSPER and CONARC studies will be used, and appropriate agencies will be consulted. To determine objectives, presently stated objectives will be collated, and tentative ones, derived from interviews and questionnaires administered to training officers and to field commanders who receive many ATC graduates, will be added. The tentative objectives will be submitted to appropriate agencies of DCSPER and CONARC, and a set of agreed-upon inferred and already-stated objectives of training will emerge. For this set, a list of premises will be prepared, which will include principles of training and personnel management, expectations about the short-term future sociopolitical climate, anticipated advances in educational technology, and legal and administrative constraints. Each training objective will be explicitly related to its premises. Thus, it will become possible to evaluate a training objective in terms of the appropriateness of its premises.

Concurrently with this analysis, the ATC system will be studied to determine how each component contributes to each objective and how the contributions of different components relate to each other. Thus, projected changes in objectives could be related to projected changes in emphasis given different components. As this program of coordinated analysis and observation continues, it will make possible identification, given particular premises, of aspects of relations among components that may be expected to lead to operation less than 100% efficient, or to problems in turning out an excellent ATC product. Also identifiable will be training programs that, given particular premises, will not "pay for themselves" in later utilization, or will give insufficient or excessive emphasis to particular components.

The final product of the Work Unit will be a series of reports that describe the present and projected future ATC systems in the light of inferred and stated objectives, given particular sets of premises. Problem areas and possibilities for heightened efficiency will be pinpointed. For these and for those already identified in ES-69, suggestions will be made about how to heighten efficiency or take preventive or remedial action, or about how to develop plans for such.

5. Estimated Professional Man-Years Required:

FY 69: 3.0

FY 70: 4.5

6. Interested Agencies:

U.S. Continental Army Command

Field commands that receive a high proportion of ATC graduates

7. Work Sub-Unit Summary and Forecast:

I. Continuing analysis of projected ATC objectives, premises, and component interactions:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PC	PCA	CA	AD	D	CAD	AD	DS

II. Continuing pinpointing of possibilities for heightened efficiency and component interaction problem areas:

FY 69				FY 70			
1	2	3	4	1	2	3	4
		PCA	PCAD	CAD	CAD	CAD	DS

III. Suggestions for, or plans for development of suggestions for heightened efficiency or preventive or corrective action.

a. Integrated BCT/AIT for Infantry MOSs:

FY 69				FY 70			
1	2	3	4	1	2	3	4
*CA	CA	PA	PA	PA	PA	PA	PA

b. Drill Team to support Drill SGT:

FY 69				FY 70			
1	2	3	4	1	2	3	4
P	P	C	C	C	C	A	D

c. Early electronic data processing of personnel records:

FY 69			
1	2	3	4
*CA	CA	A	D

d. Relationships among Armed Forces Examining and Entrance Stations, Reception Stations, and Army Training Centers:

FY 69			
1	2	3	4
*C	C	CA	D

ATCSYSTEM

- e. Recognition and use of leadership potential in the replacement stream:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PC	PC	G	C	C	A	AD	DS

Additional suggestions or plans as pinpointing proceeds.

WORK UNIT STATEMENT

1. Correlational Analysis of Aviator Performance—PREDICT (New)
2. Location: HumRRO Division No. 6 (Aviation)
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research. To develop operational systems for predicting performance of Army aviators during training and operational assignments by means of computerized multiple regression equations and probability tables. The initial system will be designed for use in secondary selection in the aviation training program.
 - b. Potential Military Research End-Result. The products of this research will be operational systems designed to enhance the effectiveness and efficiency with which personnel decisions pertaining to Army aviator selection, training, and assignment are made. The result should be better utilization and management of the Army aviator—one of the Army's important and costly personnel resources.
 - c. Background. Army aviation managers can benefit from rapidly available summaries of data describing the relative potential of individuals and groups for important military performances including (1) successful completion of training, (2) differential transition and advanced training assignments, (3) continuance in service after expiration of obligation, and (4) avoidance of accidents.

The U.S. Naval Aviation Training School now maintains an operational system for predicting successful completion of flight training. Ongoing HumRRO research indicates that the establishment and expansion of similar systems for the Army aviation system are feasible. The initial system for aviation training will build upon the foundation provided by the primary selection instrument of the U.S. Army Behavioral Science Research Laboratory (BESRL), the FAST battery. It will also make use of attitudinal, motivational, and other evaluative data developed in previous HumRRO research on (1) training requirements for aviation Warrant Officers and (2) aviator performance under stress, in addition to standard records of performance generated by the Army as an inherent part of aviator development. The basic product of each predictor system will be a continuously updated set of computerized multiple regression equations and prediction tables showing odds for and against success of individuals or groups in specific situations according to scores derived from the equations. The equations will be based on empirically developed optimum combinations of the best predictors available.
 - d. Method of Attack. Ongoing work under ES-70 will provide a listing of existing information on Army aviators. A system is under construction for (1) collecting readily available quantitative information describing Army aviators and their performance and (2) centralizing it in a computerized Army Aviator data bank. In Work Unit PREDICT the various

PREDICT

sets of information will be evaluated and those which prove valid will be integrated into a predictor battery based on multiple correlation matrices and their derivative multiple regression equations. Close coordination will be maintained with BESRL to prevent duplication of that agency's ongoing related research and to continue mutually agreeable division of effort. Construction of the first system will involve (1) comparing each set of available quantitative information against every other set to obtain an intercorrelation matrix, (2) quantifying criterion variables in cases where no quantification now exists, (3) deriving regression equations for prediction of success and failure in initial and advanced flight training assignments, and (4) cross-validating the system using a new group of aviators. It is planned that the cross-validated system be completely operational on Army automatic data processing equipment by the end of FY 1970. However, portions of the system may become operational by the middle of FY 1970. Specific information on characteristics of successful aviators for certain transition courses will be available by the end of FY 1969.

5. Estimated Professional Man-Years Required:

FY 1969: 3.0

FY 1970: 4.0

6. Interested Agencies:

Office of Personnel Operations, Department of the Army
 U.S. Continental Army Command
 U.S. Army Combat Developments Command
 U.S. Army Board for Aviation Accident Research
 U.S. Army Aeromedical Research Unit
 U.S. Army Behavioral Science Research Laboratory
 U.S. Army Human Engineering Laboratories
 U.S. Army Medical Research Laboratory
 U.S. Navy Aerospace Medical Institute
 U.S. Naval Air Technical Training Command
 U.S. Air Force Personnel Research Laboratory
 U.S. Air Force Aerospace Medical Research Laboratory

7. Work Sub-Unit Summary and Forecast:

I. Compilation of existing data, and development of intercorrelation matrices and predictive equations:

FY 69				FY 70			
1	2	3	4	1	2	3	4
PCA	CA	CA	CAD	PCADS	PCADS	PCADS	PCADS

Scope of addition Work Sub-Units to be determined by the results of PREDICT I.

WORK UNIT STATEMENT

1. Development of Training Management Procedures for Heterogeneous Ability Groups-STOCK (Continuing)
2. Location: HumRRO Division N6, 1 (System Operations)
3. Sponsor: U.S. Continental Army Command
4. Scope:
 - a. Objective of Research. To develop practical techniques for the management of entry-MOS training programs in order that they may more effectively use individualized instruction for students at all aptitude levels.
 - b. Potential Military Research End-Result. Research in this area should provide information that will enable the Army to:
 - (1) Effectively utilize task analysis procedures during curriculum development.
 - (2) Utilize individualized instructional techniques more effectively.
 - (3) Make better use of training resources through the use of self-instructional materials.
 - (4) Provide more effective training situations for personnel at all aptitude levels.
 - (5) Provide more effective field utilization of personnel with different abilities.
 - c. Background and Summary. With the increased input of lower ability personnel into the Army under Project 100,000, training problems have arisen due to the wider range of aptitudes within the military classroom. While individualized instruction alleviates these problems, its application to training has been hampered by the managerial difficulties it creates, such as the need to identify individual training requirements and to develop personnel/training management procedures to accommodate differences in student progress and achievement.

HumRRO has been assisting the U.S. Army Quartermaster School to revise the Supplyman (MOS 764.10) course as part of Task 8d of Project 100,000. The focus of HumRRO's effort was construction of an end-of-course performance measure administered to graduates of the pilot classes. To this end, a task analysis technique amenable to computer processing was developed in STOCK I to identify all relevant tasks, skills, knowledges, and performance standards required of the Supplyman. The results of this analysis were used in a further revision of the pilot course as well as in construction of the end-of-course performance test.
 - d. FY 69 Projection. STOCK I will be completed with the preparation of a Consulting Report to the Quartermaster School describing the development of the task analysis technique and its application to the Supplyman curriculum.

STOCK

STOCK II will be concerned with the application of individualized instruction techniques to selected supply courses to provide a setting for the study of related training management problems. The selection of courses will be reached in coordination with the Quartermaster School and the Office of Personnel Operations, Department of the Army, and will be based upon such considerations as student density, complexity of content, and the nature of the trainee input. HUMRRO will work with the School in identifying and analyzing supply tasks, and in establishing appropriate training objectives and performance standards. Assistance will also be provided in developing individualized instructional materials.

STOCK III will be directed toward the development of effective techniques for managing individualized instructional programs. The first phase will attempt to identify specific problems resulting from the use of individualized instruction at various military schools and training centers. Based upon this information, alternative approaches to the management of individualized instruction will be formulated. These approaches will be applied to the selected courses on an experimental basis and evaluated under later phases of STOCK III.

5. Estimated Professional Man-Years Required:

FY 69: 2.5

FY 70: 3.5

6. Interested Agencies:

Office of the Assistant Secretary of Defense (Manpower)
Office of the Deputy Chief of Staff for Personnel,
Department of the Army
Office of Personnel Operations, Department of the Army
Office of the Deputy Chief of Staff for Logistics,
Department of the Army
U.S. Army Quartermaster School
U.S. Army Schools and Training Centers

7. Work Sub-Unit Summary and Forecast:

I. Evaluation of the supplyman training program:

FY 69			
1	2	3	4
*DS			

II. Development and application of a task analysis technique:

FY 69				FY 70			
1	2	3	4	1	2	3	4
P	P	CA	CA	CA	CA	D	D

III. Development and evaluation of training management procedures:

FY 69				FY 70			
1	2	3	4	1	2	3	4
			P	P	CA	CA	CA

EXPLORATORY RESEARCH STUDY
(Unfunded)

1. Title: Civilian Work Force—ES- ? (New)
2. Location: To be determined
3. Sponsor: Deputy Chief of Staff for Personnel, Department of the Army
4. Scope:
 - a. Objective of Research. To determine the feasibility of research aimed at increasing the Army's ability to meet the training needs of its civilian work force.
 - b. Military Problem. Because of the lead time required to study, plan, and implement programs designed to increase the Army's ability to meet training needs of the Army civilian work force, information is needed concerning the overall scope of the training problem ahead, the size and nature of the resources and system revisions required for more efficient operation, and the potential application of training technology to Army civilian training.
 - c. Approach. The feasibility of making an assessment of anticipated training requirements for the Army's civilian work force will be determined. Pending the results, a review of the current state-of-the-art in various aspects of training technology will be done to determine potential applications to civilian training. Fruitful areas of research toward development of improved training systems will be determined.
5. Estimated Professional Man-Years Required:

FY 69: 2.0
6. Interested Agency: U.S. Continental Army Command

TECHNICAL ADVISORY SERVICE

TAS

Technical Advisory Service

Individual Training and Performance (Research Area 1)

HumRRO Division No. 1 (System Operations)

0.5 BMY

Technical Advisory Service (TAS) activities are anticipated for the Department of the Army, and the U.S. Continental Army Command and its subordinate training agencies in the area of computer-administered instruction (CAI). Assistance may also be provided to the U.S. Army Quartermaster School in connection with simulation of logistics systems. Other TAS activities are anticipated in connection with earlier research efforts, particularly in the area of electronics maintenance.

HumRRO Division No. 2 (Armor)

1.0 BMY

TAS to provide human factors information guidelines, predict training requirements, and assist in evaluative testing will be continued as requested by the U.S. Army Combat Developments Command Armor Agency, U.S. Army Armor School, U.S. Army Training Center, Armor, U.S. Army Armor and Engineer Board, and U.S. Army Maintenance Board. Assistance will also be provided to the Commanding General of the U.S. Army Armor Center in his study of training problems of particular significance to Armor.

HumRRO Division No. 4 (Infantry)

1.5 BMY

A request has been received from the U.S. Army Infantry School for identification of critical knowledges and skills required of the graduate of the Noncommissioned Officer Candidate School (NCOCS). It is anticipated that these knowledges and skills will have been included in those identified for the infantry rifle platoon leader in Work Unit LEAD, and that the Infantry School request can be met by TAS oriented toward eliminating from the LEAD knowledges and skills those which are not appropriate for the NCOCS graduate. In addition, a continuing item of TAS will be support of the Infantry School's Electives Program. It is expected that other TAS requests will occur though their specific nature cannot be anticipated at this time.

HumRRO Division No. 5 (Air Defense)

1.0 BMY

Human factors information and assistance in human factors evaluations of weapon systems will continue to be provided to the U.S. Army Air Defense Board and the U.S. Army Combat Developments Command Air Defense Agency. Aid will also be provided to the U.S. Army Air Defense School in its efforts to utilize the results of Work Unit STAR on aircraft recognition training.

HumRRO Division No. 6 (Aviation)

0.5 BMY

The U.S. Army Aviation School has requested assistance relating to training devices, a student-instructor ratio study, and audio-visual instructional materials. The U.S. Army Primary Helicopter School has requested assistance in evaluation of revised curriculum. Assistance to the Utility Tactical Transport Aircraft System study of the U.S. Army Combat Developments Command is also anticipated.

Training for Leadership, Command, and Control (Research Area 3)

HumRRO Division No. 4 (Infantry)

0.5 BMY

The U.S. Army Combat Developments Command Infantry Agency (USACDCIA) has requested consultative support for the Phase II work on the Infantry Rifle Unit Study-75 (IRUS-75). This consultation will consist of (but will not be limited to) review and analysis of proposed experimental designs and procedures, review of basic assumptions underlying experimentation, and review and comment on findings of experimentation. It is anticipated that some assistance will be rendered, as well, to USACDCIA in the form of literature surveys.

Language and Area Training (Research Area 4)

HumRRO Division No. 7 (Language and Area Training)

0.5 BMY

Consulting services will be provided to the Defense Language Institute on problems of language training and language research. In addition, consulting services will be provided to overseas commands on matters concerning advisor-counterpart relations and the development of advisor debriefing procedures. Consulting services will also be provided to various schools and agencies on the design, conduct, and evaluation of area training.

INDEXES

WORK UNITS

Code Name	Title	Page
ACTION	Research for Improvement of Infantry Stability Operations Training:	55
APSTRAT	Training Strategies Appropriate to Aptitude Level for Selected Training Courses	3
AREA	Development of Concepts and Techniques for Area Training	69
ATCSYSTEM	Analysis of the Army Training Center System.	105
AUTOSPAN	Development of a Generalized Method for Preparing Self-Instructional Foreign Language Courses	71
CAMBCOM	Knowledges, Skills, and Thought Processes of the Battalion Commander and Primary Staff	57
COMSERVE	Development of a Manual for Community Service Volunteers	73
COPE	A Program of Instruction for the Development of Cultural Self-Awareness	75
DEBRIEF	Feasibility Study of a System for Debriefing MAAG Advisors	77
ENDURE	Tank Crew Performance During Periods of Extended Combat	49
FORGE	Factors in Organizational Effectiveness	59
IMPACT	Instructional Model/Prototypes Attainable in Computerized Training . . .	91
INGROUP	Small-Group Instructional Methods	95
JOBTEST	Proficiency Measurement Techniques	97
LEAD	Development of Training for Improving the Combat Skills of Leaders in Small Infantry Units	61
MANICON	Determination of Performance Capabilities and Training Requirements for Manual Command and Control Functions of the Sentinel Weapon System	63
MANPROBE	Human Information-Processing Requirements in Manned Aerial Reconnaissance and Surveillance Tasks	5
MBT	Training Guidelines for the US/FRG Main Battle Tank	7
NIGHTSIGHTS	Training Techniques for New Night Vision Devices	9
PREDICT	Correlational Analysis of Aviator Performance	109
REALISTIC	Determination of Reading, Listening, and Arithmetic Skills Required for Major Military Occupational Specialties	13
REFOCUS	Implementation and Modification of the USMACTHAI Advisor Debriefing Program	79
REFRACT	Factors Influencing Effectiveness of Advisor-Counterpart Interactions . .	81

Code Name	Title	Page
SKILLCON	Curriculum Engineering to Enhance the Soldier's Resistance to Stress in Combat and Hazardous Job Situations	17
SKYFIRE	Training Methods for Forward Area Air Defense Weapons	19
SOJOURN	Overseas Military Posts and Communities	85
SPECTRUM	Development of Efficient Training Across All Aptitude Levels	23
STAR	Aircraft Recognition Training	27
STOCK	Development of Training Management Procedures for Heterogeneous Ability Groups	111
SUPPORT	Development of Improved Training for Combat Support Training	29
SYNTRAIN	Modernization of Synthetic Training in Army Aviation	31
UPGRADE	Improving Aviation Maintenance Training Through Task and Instructional Analysis	35
UTILITY	Study of Men in Lower Mental Categories: Job Performance and the Identification of Potentially Successful and Potentially Unsuccessful Men	39

EXPLORATORY RESEARCH STUDIES, BY TITLE

Title	Number	Page
Human Performance Degradation	ES-54	51
Logistics Systems	ES-63	52
Manual Format	ES-58	41
Troop Information	ES-60	65
U.S.-Thai Security Guard	ES-73	87
[Civilian Work Force]	ES-	115
[Personnel Management Technicians]	ES-	45

EXPLORATORY RESEARCH STUDIES, BY NUMBER

Number	Title	Page
ES-54	Human Performance Degradation	51
ES-58	Manual Format	41
ES-60	Troop Information	65
ES-63	Logistics Systems	52
ES-73	U.S.-Thai Security Guard	87
ES-	[Civilian Work Force]	115
ES-	[Personnel Management Technicians]	45

BASIC RESEARCH STUDIES, BY TITLE

Title	Number	Page
Behavior Management	BR-18	101
Common Job Elements	BR-8	99
Definition of Learning Variables	BR-19	102
Prompting and Guidance	BR-14	100
Visual Pattern Discrimination	BR-16	43

BASIC RESEARCH STUDIES, BY NUMBER

Number	Title	Page
BR-8	Common Job Elements	99
BR-14	Prompting and Guidance	100
BR-16	Visual Pattern Discrimination	43
BR-18	Behavior Management	101
BR-19	Definition of Learning Variables	102

RESEARCH DIVISION PROGRAMS

Title	Page
Division No. 1 (System Operations)	
IMPACT	91
STOCK	111
Logistics Systems (ES-63)	52
Manual Format (ES-58)	41
Division No. 2 (Armor)	
ENDURE	49
JOBTEST	97
MBT	7
NIGHTSIGHTS	9
Common Job Elements (BR-8)	99
Prompting and Guidance (BR-14)	100
Behavior Management (BR-18)	101
Division No. 3 (Recruit Training)	
APSTRAT	3
ATCSYSTEM	105

Title	Page
REALISTIC	13
SKILLCON	17
SPECTRUM	23
SUPPORT	29
UTILITY	39
Division No. 4 (Infantry)	
ACTION	55
CAMBCOM	57
FORGE	59
INGROUP	95
LEAD	61
Troop Information (ES-60)	65
Definition of Learning Variables (BR-19)	102
Division No. 5 (Air Defense)	
MANICON	63
SKYFIRE	19
STAR	27
Human Performance Degradation (ES-54)	51
Visual Pattern Discrimination (BR-16)	43
Division No. 6 (Aviation)	
MANPROBE	5
PREDICT	109
SYNTRAIN	31
UPGRADE	35
Division No. 7 (Language and Area Training)	
AREA	69
AUTOSPAN	71
CONSERVE	73
COPE	75
DEBRIEF	77
REFOCUS	79
REFRACT	81
SOJOURN	85
U.S.-Thai Security Guard (ES-73)	87

WORK PROGRAM, FISCAL YEAR 1969 FOR
THE DEPARTMENT OF THE ARMY

Human Resources Research Office

January 1969

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